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« EDITORIAL »

Prepare for Better Times, Build New Ships Now

OVER a century and a quarter ago the young American republic made it clear to the Barbary pirates and the world in general that it was prepared to spend millions for defense, but not a cent for tribute. Surely as far as material riches is concerned we can afford to spend billions now more readily than we could millions then under similar circumstances. We are engaged now in a struggle on sea and land, the consequences of which are far more serious than the piratical raids on commerce which caused the manifesto quoted above. What we need is to resurrect the spirit of those earlier days.

Never before in history has any nation prepared so comprehensive a plan for an economic revival of its merchant marine as that of the Jones-White act. It is unthinkable to let this sound plan crumble and fall to pieces because of the temporary disruption of normal business due to prevailing world conditions. This carefully considered plan should be carried out with all possible vigor with such modification in terms as may be necessary to carry it over the present period. The established shipping routes and mail contracts based on the known needs of our commerce must be maintained.

There was never a better time than the present for wise capital expenditures. Prices for material and labor are at new low levels. Much can now be obtained for every dollar expended. Instead of cessation of new shipbuilding to completely modernize every shipping line operating under a mail contract, the government should encourage the immediate and vigorous prosecution of a program for replacements of all obsolescent and second rate vessels now in use on many of these mail routes. Financially this would be at the very worst a comparatively slight burden on the government, but its effects would be far reaching in the employment given not only in shipyards, but in all the industries supplying the material, equipment and service necessary in the building of a modern ship. No saner method could be devised in spending for a permanently useful and necessary purpose.

This in no way means a thoughtless helter skelter distribution of money for the benefit of any special interests. Sums made available for the building of efficient modern ships for the definite purpose of employment in the ocean trade routes of our commerce is a constructive economic move and must be undertaken if these lines are to have any hope of competing with foreign ships. As a matter of fact we cannot now afford to stop. We should carry out our plan of modernizing our merchant marine along these lines. If this is not done the mail lines under the American flag will lose a great opportunity when business revives.

Every dollar the government contributes for this purpose at the present time will be returned to it many times over. If wisdom and courage do not prevail in the present emergency as far as the merchant marine is concerned, much of what has so far been gained will be lost. Not only will such new ships be more efficient in operation, but they are bound to attract an increasing volume of business. With diminishing demand the second rate ship cannot hope to get any appreciable share of patronage. Why not make it possible for American mail lines to offer the finest kind of service? Expenditure for this purpose is money wisely spent and money wisely spent at this time will help to restore confidence. Let us go ahead, let us exercise some of the spirit of an earlier day.

Leading the World in Exports

IT HAS become a habit in certain quarters to minimize the importance and the value of our export trade with a resulting apathy and indifference to any claim that an American merchant marine is necessary to our national welfare and prosperity. To offset this completely erroneous attitude it would be well for every thinking American to carefully consider a recent statement by Secretary of Commerce Lamont.

Far from having lost its foreign trade prestige, the United States led the world in exports in 1931. Importance of our foreign markets to

farming, mining and manufacturing interests, even in a year of depression and drastic price declines such as 1931, is indicated by the value of our domestic exports which amounted to $2,377,981,786, every state and territory participating. Germany, second in rank of exports, showed a value of $2,192,350,000, while the United Kingdom in third place, including re-exports, reached a total of $2,069,823,000 in value. All other countries showed much smaller totals, France, in fourth place, attaining a value of only $1,192,516.

Of what significance is this tremendous export trade to American labor? The secretary's answer is that more than 1,400,000 workers directly engaged in producing goods for export in 1931 received more than $1,500,000,000 in wages. Probably an equal additional number of workers were employed indirectly in service activities and in supplying the needs of those engaged directly.

What could more forcibly bring home to every individual, wherever he lives, the need of a merchant marine of our own so that this great trade and its future growth will not depend entirely on the convenience and the will of foreign carriers. We do not need to, do not want to, and do not expect to carry more than a fair proportion of this trade in ships flying the American flag. But what an utterly indefensible policy it would be to depend solely on foreign carriers for the delivery of this vast volume of goods. As the world recovers from existing conditions this volume will be expanded to a much higher level and we must be prepared with merchant ships of our own to take our rightful place in world trade.

New Metals Used in Shipbuilding

SHIPBUILDING, like any other industry, must prepare to discard custom, to adopt new methods and materials as they are developed and proven of value. In this connection W. E. Blewett, Jr. of the Newport News Shipbuilding & Dry Dock Co. recently presented an interesting paper on *New Metals Used in Shipbuilding,* at a meeting in New York of the American Society for Steel Treating. The shipbuilder is prone, to hold to the materials which he knows from practice to be reliable. Undue risks should not be taken. Nevertheless new materials are constantly finding their way into shipbuilding.

The author states that the most important materials used aboard ship are the high tensile steels, alloy and heat treated. Of these two the alloy steels as a group is more expensive and the one for which best results may be expected.

No less than seven alloy steels have recently been experimented with for ship construction. In deciding which steel will give the best results, numerous tests should be made of steels which have been commercially prepared. Since various rollings of the same steel often give diversified results, the final answer as to the most suitable steel can only be obtained after practical application. It happens that by the time an answer is obtained other steels are offered with the claim of better characteristics. The author has tabulated chemical and important physical properties of the seven high elastic steels on which experiments were recently made.

Tests were also made on the workability of the steels in respect to punching and the results noted. Other practical experiments include joggling, shearing and flanging and although no loads were measured it was apparent that specimens could be worked statisfactorily, though he pointed out that it is likely that somewhat more hot working will have to be done than with mild steel. Experiments were carried out on welding and it was found that the strength of the weld metal remains fairly constant with an average of about 67,000 pounds per square inch. This shows that a good bond was made between the deposited metals and the plates.

It was pointed out that in addition to structural steel there are many other steels used in the construction of a ship, including large and small hull forgings, propeller line shafts, rotor shafts, crankshafts, etc. Stainless steels are rapidly finding new applications in marine work and are now being used for turbine bladings, valve disks, valve stems, etc. Stainless steel is also useful in galley equipment and for fittings and ornamental work in passenger quarters.

Materials for rivets going into the ship's hull, especially the under water part, are always a source of argument, some preferring iron, others alloy, and still others plain mild steel. In determining the best material to use the service of the ship should be considered. Proper heating and driving of shell rivets are also important for good rivet material can be ruined by improper use. An important group of materials in ship construction is the nonferrous metals and their alloys. In a ship of 30,000 tons displacement approximately 350 tons of nonferrous metals are used.

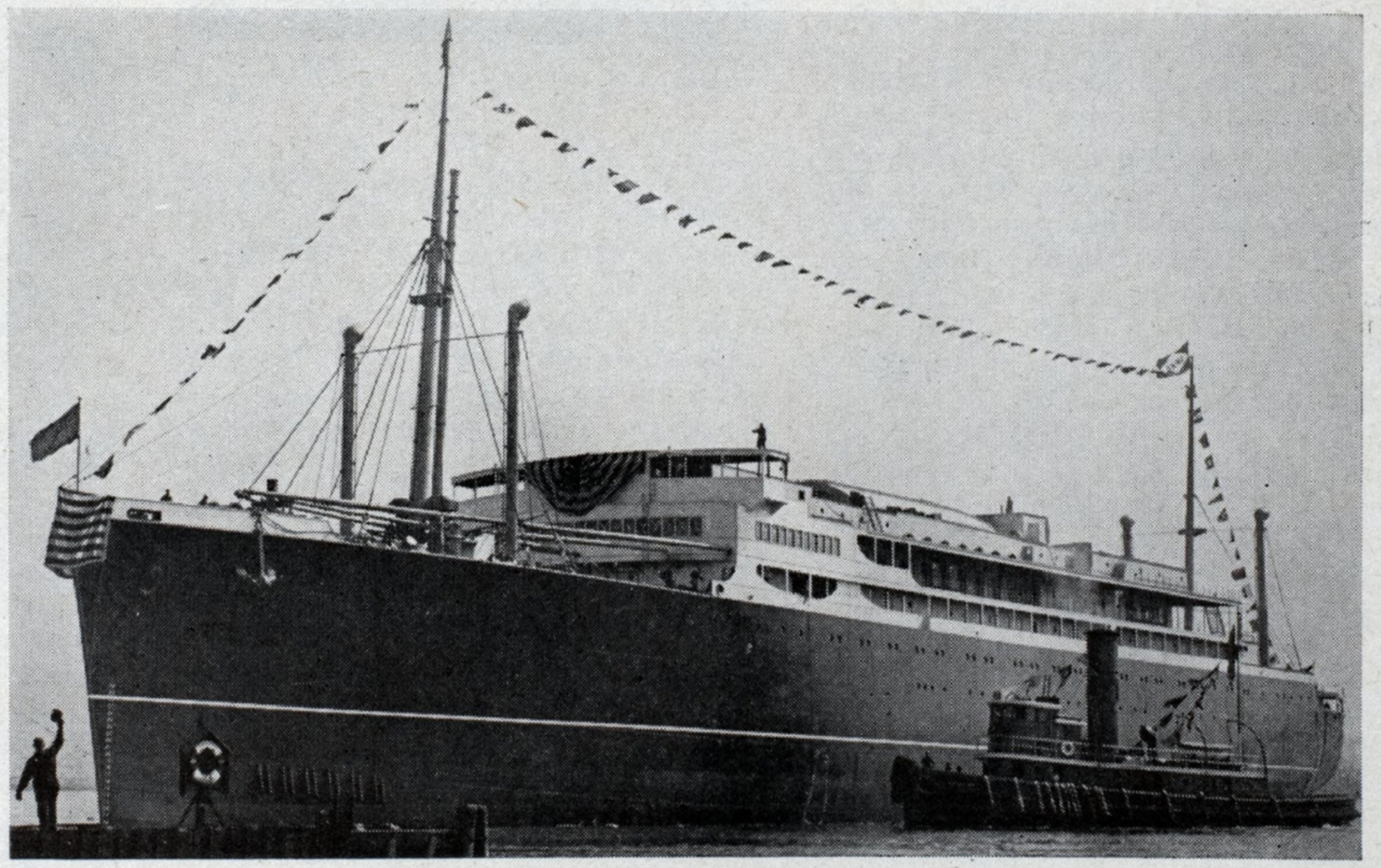
An interesting phenomenon in connection with copper pipe was touched upon. Pipe of

this material used in the sanitary and salt water circulating systems on the CALIFORNIA and VIRGINIA showed severe pitting after a short period of time. It was first thought that this pitting was caused by stray electric currents, but the pipe lines in question were checked and no currents found. It was then suggested that electrolytic action might have been set up between the iron impurities in the pipe and the copper with the salt water acting as an electrolyte, but this condition was never proved as the copper used was seemingly pure. The pipe was replaced with red brass pipe, which is more difficult to work, but the pitting action continued. On recent ships in these same systems genuine wrought iron galvanized pipe has been used and up to the present time no serious complaints have been received. It is understood that the navy department experienced trouble along these same lines and is now making extensive investigation of materials for these services.

Opinions relative to the use of condenser tube material are very diversified. For most of the condensers built at the Newport News yard admiralty metal, containing 70 to 72 per cent copper, 1.2 per cent tin, 0.06 per cent iron maxinum 0.075 per cent lead maximum, and the remainder zinc, has been used because of its ductility and its resistance to corrosion. In recent ships condensers have been fitted with black skin finish admiralty metal tubes, the name being due to a finish of cupric oxide giving the tube a black color and which serves as a protection against corrosion. In a search for still better material the yard is now using an aluminum bronze tube composed of 76 per cent copper, 22 per cent zinc and 2 per cent aluminum.

By giving so freely of the information developed by experimentation and in practice at a considerable cost to his principals, Mr. Blewett in this paper is making a valuable contribution to the art of shipbuilding, and as he rightly points out, as the service becomes more severe the material situation from the shipbuilder's viewpoint becomes more and more complex and the option of selection greater. It means that the shipbuilder has to be versed in the latest developments and requirements and must be able to correctly evaluate the actual performance of the materials offered, to be on the safe side.

Santa Rosa, Grace Liner, After Launching



SANTA ROSA, first of four sister ships building at the Federal Shipbuilding & Dry Dock Co., Kearny, N. J., for the Panama Mail service of the Grace line; launched, March 24, sponsored by Miss Wendy Iglehart. At that time sister ships SANTA LUCIA and SANTA PAULA, well advanced in construction occupied adjoining berths; keel of the fourth sister ship, the SANTA ELENA was immediately laid on the ways vacated by the SANTA ROSA. These four ships, costing a total of over $19,000,000 are to operate between the East and West coasts of the United States via the Panama canal, touching enroute at Central American and Colombian ports. They are 508 feet in length over all, 72 feet in beam, 39 feet in depth, 10,500 gross tons; displacement about 18,000 tons; twin screws, geared turbines; maximum speed, 23 knots; cruising speed, 19 knots. Superb passenger ships with accommodations for 225 first and 70 third class passengers, they are also especially adapted for carrying cargo including 42,000 cubic feet refrigerated space for carrying perishable goods.

Man's Existence Depends on the Sea

Climatic and Weather Variations

By George E. Brandt
Lieutenant Commander U. S. N., Retired

THE waters of the oceans cover more than two-thirds of the earth's surface.

To us water is an essential substance. Our bodies are composed largely of it. It forms a large part of the things we eat. Water in the form of rain, fog, dew, or vapor is necessary for plant growth and hence for animal life. Without water the earth would be a barren desert.

The world's supply of water is in constant circulation. It might almost be said that no particle of water is ever still, but always on the move doing something somewhere.

Sea Is Always in Motion

A large part of the water from rain finds its way into the sea through rivers, which carry every kind of matter in suspension or in solution. The water in the sea is always in motion. First, there is the constant oscillation of the waves which beat upon the shore with violence in times of storm and which make the navigation of ships so difficult and dangerous. Second, there is the movement of the tides, especially noticeable on the coasts.

In the Bay of Fundy the tides rise and fall as much as 60 feet. Third, there is the constant flow of ocean currents, some of which are of enormous size and form regular rivers in the ocean basins. Some of these currents are warm and some cold. The meeting of the warm and the cold current is so clearly marked in some places, such as off the Grand Banks in the North Atlantic that a sharp line may be seen to separate them. A vessel may lie with one end in the cold current and the other end in the warm current. This is an experience not infrequently noted by the vessels of the Coast Guard on the ice patrol in the North Atlantic.

Ocean currents play an important part in determining the climate and

Lieut. Commander Geo. E. Brandt, U. S. N. Retired

weather over land areas. Water is difficult to heat, but when heated, it is just as difficult to cool. The warm currents have a great effect upon the lands adjoining them.

Consider the Gulf stream. It is a warm current which has its origin in the straits of Florida and the Caribbean region, and flows to the northward off the coast of the United States, then curves to the eastward where it ceases to exist as a well defined stream, but the waters continue to drift until the shores of Europe are approached, when one branch goes to the northeast and enters the Arctic region and another turns south in the direction of the African coast. This warm gulf stream moderates the climate of our eastern seaboard and also that of northern Europe. We can appreciate the importance of this stream to the people of northern Europe, when we contrast the relatively mild climate of Norway with the frozen coast of Greenland in the same latitude. The shores of Greenland are washed by the cold current that comes down from the Arctic region.

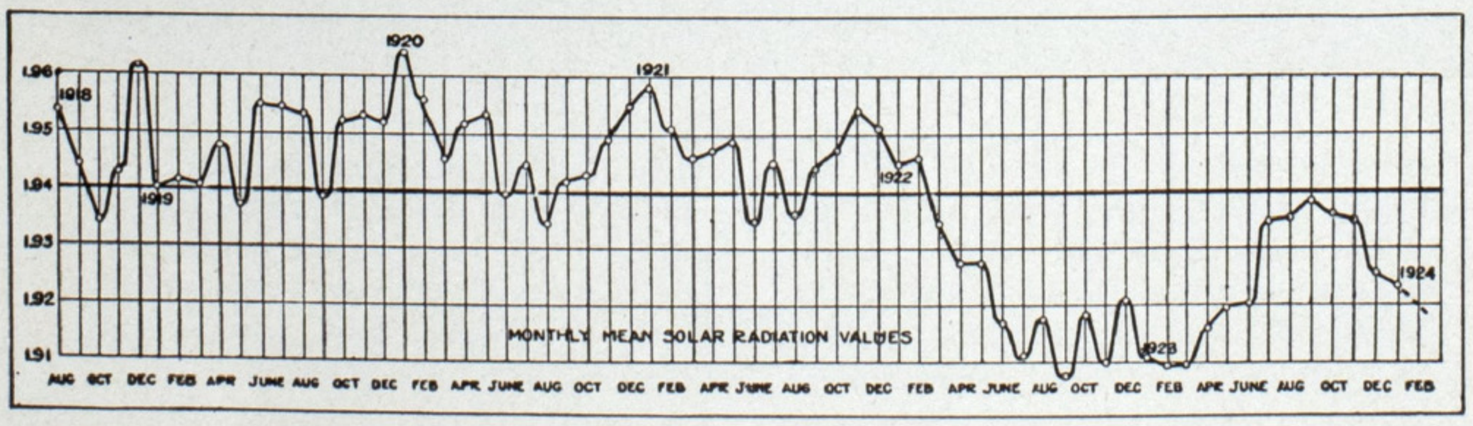
Currents in North Pacific Ocean

There are similar hot and cold currents in the North Pacific ocean. As a result of the warm current, the city of Sitka, Alaska, has the same average temperature as Washington, D. C. though it never gets so warm in summer nor so cold in winter. Sitka is nearly twelve hundred miles farther north than Washington, in nearly the same latitude as the southern tip of Greenland. Contrasted with this, we have Vladivostok, where, partly due to the cold current coming down from the frozen north, the winters are extremely cold. 40 degrees below zero is not unusual in Vladivostok. Yet Vladivostok is in the same latitude as Northern California or Marseilles, France, or Constantinople, or Rome, Italy.

The waters of the ocean are a great reservoir for storing and distributing the heat which comes from solar radiation. During every hour of sunshine, more heat is being added to this reservoir. In turn this heat is given up by the waters of the ocean, influencing the weather over land and sea. The radiation from the sun, as shown from careful observations made by the astro-physical observatory of the Smithsonian institution, varies considerably from month to month and year to year. This variation is what makes the weather such a complicated study.

Since the waters of the ocean act as an intermediate reservoir for heat, the full effect of a change in solar radiation is not felt until some years after the change takes place. The weather for 1932-33-34 has been determined, at least, in a large part, by the heat stored in the waters of the ocean from the solar radiation of 1928-31.

The weather which we know on land has its origin largely in the



A Partial Record of Solar Radiation. Variation by Month and Year

waters of the ocean. Thus the rainfall of our southern and middle western states consists mostly of waters from the Gulf of Mexico and the Caribbean sea. Similarly, the weather of our Pacific coast is born in the waters of the Pacific ocean, and the weather along the Atlantic coast of the United States is greatly influenced by the waters of the Atlantic.

The deeper waters of the oceans also play an important part. In the summer a strong current flows southward off our Pacific coast, swinging outward off California. As this current moves away from shore, the deeper waters which are very cold work their way up from the bottom and come to the surface along the coast. Consequently, off the coast of California, we find an area of cold salt water. The winds which blow off the Pacific ocean are warm and laden with moisture from the free evaporation of the waters. When this warm, wet wind strikes the cold water area along the coast, the air is chilled and the water vapor it contains is condensed in the form of fog. This is the explanation for the prevalence of fog on our Pacific coast in summer. Much of this fog is lost in the sea. When the wind strikes the land it becomes warm again and very dry because it has lost its moisture as fog. We see, therefore, that the upwelling of the cold bottom water on the coast of California causes the rainless cool summers of that state.

The study of the waters of the ocean will in time yield results worth millions of dollars to the agriculture and industry of the nation because from these studies, considered in connection with the land elements, we can get a better understanding of the weather long in advance, particularly the periods of rainfall and drought and their duration. There is no industry, no business, no amusement, no interest of any sort that does not rely to some extent upon the weather.

Observing Station of the Smithsonian Institution at Mt. Wilson, Calif., for Studying Solar Radiation and Other Physical Phenomena

We are just at the beginning of this science of forecasting weather long in advance. The mathematics and theory of weather have been studied with great success by the scientists of our weather bureau, the Smithsonian institution, and by independent establishments, but this splendid mathematical structure finds only limited application because our knowledge of the physical conditions of the waters of the oceans is so incomplete. When we know as much about the waters of the oceans as we know of the land elements, we shall have the means of using our mathematical theories to practical advantage for predicting with certainty the weather that may be expected a year or two years from now for a given locality.

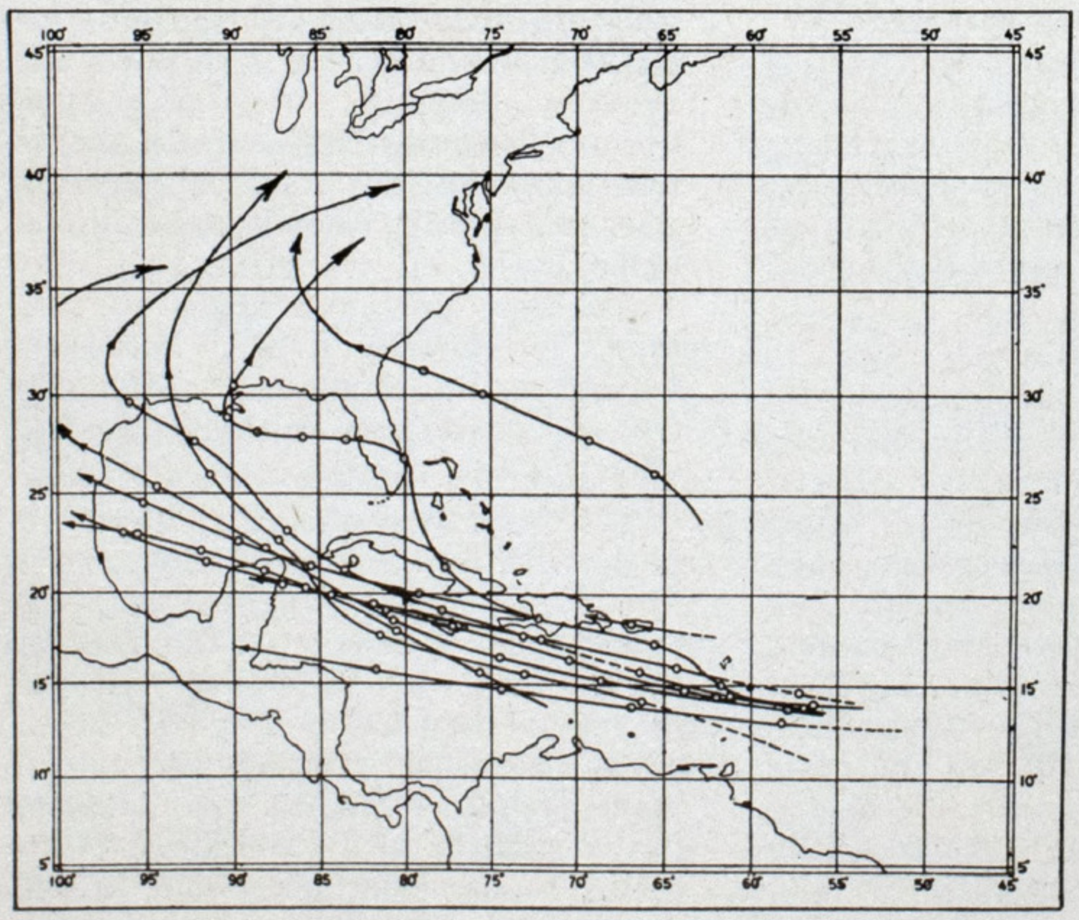
Sir John Murray, the eminent oceanographer, is authority for the statement that the animal and plant resources of the oceans probably exceeds those of the lands. There is a possibility of carrying on in the ocean something that might be called cubical agriculture, or farming in three dimensions. Where as on the land farming is limited to the surface, we have in the ocean farms piled on farms; 500 feet of them like the different stories in a sky-scraper.

Upon the muds of the sea depend its rich fertility. The basic life from these muds is not, of course, herbage, but huge swarms of microscopic organisms, plants and animals. Among these huge swarms is perhaps the fundamental organic principle of the life in the sea. Step by step they feed the next larger organisms until, finally the fish we eat depend upon the mud.

As an example, take the cod, a most important food fish. It exists only in cold water, where food is plentiful. The cod feeds on bottom scavengers, mostly crustaceans and echinoderms, which have previously consumed dead organic matter, preserved in the cold waters as in an ice-box.

So we see that the oceans make the earth liveable for man. The sea helps to distribute the heat of the sun, yet the circulation of the icy waters of the polar regions prevents the sun from baking the earth. Through evaporation of the surface waters, which later fall upon the land as rain, the sea makes agriculture possible, and at the same time purifies the air we breathe.

The sea enables plants to live upon the earth, for it is the beginning and end of all streams that pass through the land. In time these streams carry nourishment to the plants in the sea. The ocean yields a rich harvest of food, for the catch in the fisheries in the United States and Alaska is nearly three billion pounds of fish a year. It is the highway of navigation and unites the distant dwelling places and the different races of men. It is a wonder to the curious, a challenge to the daring, an inspiration to all.



The Paths of Some West Indian Hurricanes Showing the Weather Born in the Sea Makes a Procession Over the Land

European Shipping Improved in Tone

Number of Cargo Liners Commissioned or Preparing for Further Service —Increases in Scrap Prices—Plans for Reconstituting Kylsant Group

By Frank C. Bowen

THE last few quarterly reviews that have appeared in MARINE REVIEW have been depressing in the extreme, but now at last there are distinct signs of improvement in the shipping world. These signs are not yet supported by figures, for freights and business are still extremely depressed, but they contain evidence too strong to be disregarded. The principal indication is in the number of cargo liners which have either been recently commissioned or are now preparing for further service, for by the nature and economy of their business they are naturally the last to lay up and the last to recommission. Many of the biggest and most successful of the British owners of cargo liners are now making preparations for considerably increased business, and if they cannot see the signs nobody can.

Another good sign is the fact that when the Port of London Authority offered two million pounds' worth of five per cent stock in lieu of the existing seven per cent it was over-subscribed over twenty-five times within half an hour. This is a distinct step in the right direction, but of course this stock is in a particular category and it will probably be a very considerable time before the full effect of the restoration of investors' confidence is felt in the shipping industry. Before that time comes it will probably be necessary to rationalize the remaining companies which were formed on an absolutely false foundation during the war boom, many of which are kept alive only by the action of the mortgagees, principally the banks.

Another comforting item for the passenger shipowner is the enormous business which is being done in yachting cruises this year. With so little genuine passenger business offered, the companies have gone in for yachting cruises as they never have before, and have found wonderful support among the British holiday makers who have been accustomed to continental tours.

With regard to yachting cruises the P & O Co. is trying a particularly interesting experiment, for they are confining their first class program to electric ships only. The STRATHNAVER, STRATHAIRD and VICEROY OF INDIA, with their turbo-electric machinery, ought to provide a very economical proposition at cruising speeds. It will be very interesting to compare their costs with those of the Canadian Pacific EMPRESS OF BRITAIN, whose four geared turbines are carefully arranged to give economical power at the speed required for her elaborate cruises.

Scrap Prices Have Gone Up

Another thing in favor of the shipowners is the fact that scrap prices have gone up to 20 shillings per gross ton for good ships and has stayed there, compared with ten shillings which was paid for quite a number of fine vessels only a short time ago. The position of the steel industry under the British tariff is still uncertain, but the price remains up. The only trouble is that many of the principal scrappers are now overstocked with ships to be broken up as opportunity occurs; the famous Cunard CARMANIA was sold for twenty shillings a ton with delayed delivery after many fittings had been removed, but until the scrappers can see their way to start work on her, she is costing £100 per week to keep in Tilbury docks, and there are no safe anchorages vacant where she could be put at a more reasonable price.

Against these improved British prices is the unfortunate fact that the Japanese market has dried up almost completely, although it was very valuable while it lasted, for 35 shillings per gross ton was a price worth trying for, even if it included the cost of delivering the ship to Japan.

There is also, perhaps, great hope in the fact that the scheme for reconstituting the Kylsant group has been accepted by an enormous majority of the shareholders and creditors concerned. That is not all that is necessary in such a case, and there are many legal formalities that have to be gone through which may wreck the scheme, but at the present time there seems to be every hope. One of the roots of the scheme is to divide the principal interest of the group into two big companies, one to look after the South American business and the other to look after the West African, cutting out the duplication which has hitherto run up the costs very considerably. Sir Frederick Lewis, the head of the Furness Withy group, has been persuaded to take charge of the South American business, and Mr. Richard Holt of the Blue Funnel line will tackle the West African. If anybody can unravel the tangled affairs of the group it is these two men, who are undoubtedly the most conspicuous in British shipping business, but they have to face huge problems.

Naturally enough, the British shipping industry and everything connected with it is now greatly interested in the possible effects of the new British tariff, which are yet to be seen. It has to be admitted that it has been followed by a big slump in imports, but whether this is due to the ten per cent tariffs or to the rush to get goods into the country before the duties came into force, resulting in Britain being overstocked in practically every commodity, remains to be seen. It is generally anticipated that the tendency will be to recover, with probably a very considerable increase in exports.

Allied to the tariff question is the question of free ports in Britain, a subject on which opinion is very sharply divided. Many, including some prominent members of the cabinet, consider that the present customs organization with its bonded warehouses is quite sufficient to deal with the entrepot trade of the country, which everybody agrees must be protected as far as possible. Others, on the other hand, and they include such practical men as Mr. Walter Runciman, president of the board of trade, consider that these are not sufficiently convenient or spacious for big business, and that free ports will prove a necessity. Pending a decision on the point, preparations are being made to put forward suitable sites in London, Birkenhead and other ports.

Another question allied to the tariff is whether it will not make smuggling so worth while that the cost of protecting the revenue will wipe out the additional receipts.

The Cunard company's annual report, with a net loss of half a million sterling, was roughly what was expected on account of the interim report made in December, but the fact that they have over £1,300,000 in cash came as a surprise and caused many people to modify their ideas as to the position of the company. There seems to be every hope that it will

Trend of Trade and Shipping in British Isles

	January	February	Two months ended Feb. 28/29 1932	1931
Total entrances of cargo ships into British ports:				
Number of vessels	3,742	4,325	8,067	7,515
Tons	4,225,175	4,652,761	8,877,846	8,508,764
Tonnage from Atlantic coast of North America	545,493	620,899	1,166,392	1,262,067
	(12.9%)	(13.4%)	(13.2%)	(14.9%)
Total clearances from British ports:				
Number of vessels	4,159	4,104	8,264	8,581
Tons	4,535,216	4,096,528	8,643,520	8,916,759
Tonnage going to Atlantic coast of North America	500,332	410,894	923,041	957,157
	(11.1%)	(10.2%)	(10.7%)	(10.7%)
Total value of goods:				
Exported	£36,362,416	£35,463,602	£71,826,018	£81,246,910
Imported	£62,265,982	£70,202,570	£132,468,552	£139,244,191
Exports of coal:				
Tons	3,313,073	3,232,959	6,546,032	6,803,617
Value	£2,639,445	£2,541,916	£5,181,361	£5,434,324
Tonnage shipped for use of steamers	1,234,047	1,246,613	2,480,660	2,296,030

find better times, but that depends very largely on the receipts from the subsidiary concerns. The Anchor line has again passed its dividend, the Brocklebank line is very much affected by the state of affairs in India, but the Commonwealth & Dominion Co. now has every one of its ships in commission and every prospect of steadily improving its business.

In the meantime the giant Cunarder No. 534 is still held up and appears that it will be so indefinitely, for the government is very definitely against giving state aid towards its completion and without this the Cunard is fully justified in its decision to hold up matters in spite of the amount of capital that is locked up on the work already done.

The Compagnie Generale Transatlantique, which is affected in very much the same way as the Cunard, has at last obtained its definite promise of state aid.

In the case of the German government's help in the affairs of the two big companies, the Hamburg American and North German Lloyd, the result of this interference is still to be seen, for it certainly does not seem to be nearly as great on the surface. It is true that the authorities have brought pressure to bear on the companies to effect a closer combine than the 50-year agreement which was reached.

The great Italian mergers are rapidly getting into thorough working order, and although it is still too early to foretell exactly what result they will have they are undoubtedly increasing competition already, particularly on the Eastern services.

There are still, therefore, very many things to be done before European shipping can really claim any great improvement, but the fact that there are now definite signs means a lot and although it is fully recognized that the path may be a very long one, shipping interests are feeling more optimistic than they have for a long time past.

Establish Eastern Office

The Coen Co., combustion engineers of California, manufacturer of oil burning equipment and accessories, recently established an eastern office in charge of Frederic S. Harper, who for the past 12 years has been eastern sales manager for the company. This office, located at 30 Vesey street, New York, will be the eastern headquarters of the company, having jurisdiction over all territory east of the Mississippi river. The company will continue to manufacture and distribute its products in the east and a complete service and delivery system will be maintained.

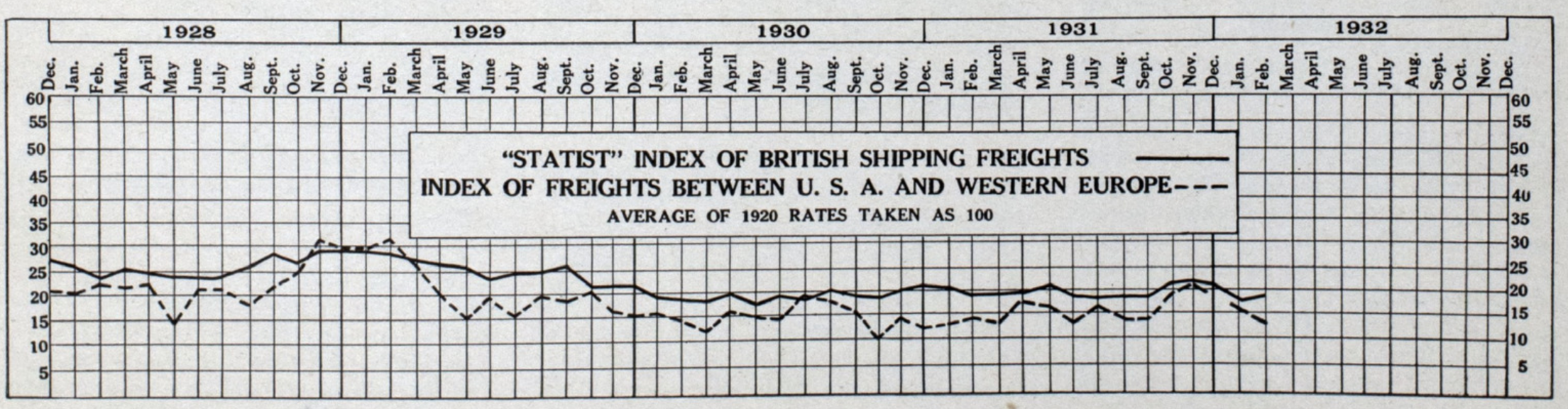
Recently the Coen company announced the completion of its improved air register firing front and mechanical burner, designed for highest efficiencies for the advanced type of marine installations, embodying high pressure steam and superheat.

North Atlantic Passenger Rates Cut by Agreement

The meeting of the representatives of the Transatlantic Passenger conference which was held in London adjourned on April 15 until May 10 when further rate adjustments, proposed curtailment of sailings and other matters of importance will be given consideration. In view of the palpable excess of tonnage now in the North Atlantic trade, shipping men seem to favor a program of reduction in the number of sailings by withdrawing part of their tonnage in order to avoid costly competition.

The conference in session in Brussels on March 31 agreed to reduce transatlantic passenger fares 20 per cent in line with a similar cut made by the United States, Cunard and White Star lines. Coincident with the Brussels meeting, the French, Hamburg-American and North German Lloyd lines announced a 20 per cent reduction in first class fares on their vessels in the North Atlantic service and a 10 per cent cut in third class rates. The 20 per cent slash also applied to second class in the German lines and to the cabin class on the French ships.

The United States Lines Co. of Nevada was admitted to membership in the Transatlantic Passenger conference in London to replace the old company, United States Lines Inc., which ceased to be a member of the conference after liquidation.


1928
1929
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Dec. Jan. Feb. March April May June July Aug. Sept. Oct. Nov.
60 55 50 45 40 35 30 25 20 15 10 5
"STATIST" INDEX OF BRITISH SHIPPING FREIGHTS
INDEX OF FREIGHTS BETWEEN U. S. A. AND WESTERN EUROPE
AVERAGE OF 1920 RATES TAKEN AS 100

Diagram Showing Fluctuation of Ocean Freight Rates for Four Years and Two Months

Volume of World Shipbuilding Reaches New Low Levels

NEW low levels in the world production of merchant shipping are shown in a statement just issued by Lloyd's Register of Shipping, covering returns from all maritime countries for the quarter ended March 31 last. Nearly 2,000,000 gross tons less of vessels are now under way than in the period just before the war, and 700,000 gross tons less than at this time last year. The decline since the beginning of 1932 has been over 100,000 gross tons. Lloyd's statement excludes figures for Russia, no returns for that country having been available for some time.

The decline in the shipbuilding of the United States during the last quarter, Lloyd's points out, was only 1,000 gross tons; but for Great Britain and Ireland there was a decrease in the same period of 27,000 tons, and for the other maritime countries, taken as a group, there was a drop of 77,000 tons.

As a result of the declines, the production of the shipyards of the United States is now only about 165,000 tons less than that of Great Britain and Ireland; whereas, a year ago, the lead of Great Britain and Ireland was more than 450,000 tons.

The comparison of the output of the various groups of countries during the quarter ended December 31 and that of March 31 last, is given in the following table of gross tonnage, prepared by Lloyd's:

	Mar. 31, '32	Dec. 31, '31
Great Britain & Ireland	372,973	400,505
United States	206,703	207,837
Other Countries	718,287	795,453
World Total	1,297,963	1,403,795

The contrast between new work and launchings during the past two quarters is shown in the following tables, the figures representing gross tons:

New Work

	Mar. 31, '32	Dec. 31, '31
Great Britain & Ireland	24,793	104,364
Other Countries	53,745	120,698
World Total	78,538	225,062

Launchings

Great Britain & Ireland	34,662	70,707
Other Countries	89,490	230,971
World Total	124,152	301,678

The following gross tonnage table shows the comparison in tanker building during the last two quarters:

	Mar. 31, '32	Dec. 31, '31
Great Britain & Ireland	59,182	65,441
Sweden	83,521	83,400
Germany	72,400	72,400
Other Countries	87,069	130,079
World Total	302,172	351,320

Once again the bulk of the world total of tanker building is devoted to motorized tonnage, 281,710 gross tons of these types of vessels being included in the current aggregate.

In other types than tankers, however, there is an increase of the recent trend away from motorship construction. Six months ago the tonnage of motor vessels being constructed was greater than that of all other types of ships combined. In the December quarter, however, only 630,000 tons of motorships were being built, as against 773,000 tons of other types. And in the quarter just ended, the lead of other than motorized types was increased to over 200,000 gross tons, Lloyd's points out. The proportion of motorship construction is now only about 42 per cent, as compared with nearly 51 per cent six months ago, and 45 per cent three months ago. How the building has compared in the last two quarters is shown in the following table of gross tonnage:

	Mar. 31, '32	Dec. 31, '31
Motor vessels	545,338	630,083
Other types	752,625	773,712
World total	1,297,963	1,403,795

In Great Britain and Ireland, during the March quarter, as in the previous quarter, only 22 per cent of the total building was of motorships. There was a decrease in the proportion of motorship building in the other maritime countries, taken as a group, however, just a shade over fifty per cent of their construction now being devoted to motorships, as compared with 54 per cent in the previous quarter. Great Britain and Ireland are now building about 7,000 gross tons less of motor vessels than at the beginning of this year, while for the other countries together, the decrease in the same period has been about 80,000 tons. In other types of construction, Great Britain and Ireland now have under way 20,000 tons less than in the previous quarter; while the other countries combined show a decline of less than 1,000 tons. Comparisons for the last quarter are given in the following table of gross tonnage:

	Great Britain & Ireland	Other Countries
Motor Vessels	82,597	462,741
Other Types	290,376	462,249
Total	372,973	924,990

The comparison in motorship building between the two quarters is shown in the following gross tonnage table:

	Mar. 31, '32	Dec. 31, '31
Germany	101,680	101,656
Sweden	92,471	89,550
Great Britain & Ireland	82,597	89,855
Italy	79,050	77,400
Holland	50,480	67,431
United States	503	3,437

Production of all types of marine engines being built or installed throughout the world also decreased during the quarter just ended.

For oil engines, the total indicated horsepower at the end of the March quarter was 436,160, as against 513,425 at the end of the December quarter. The figures for Great Britain and Ireland show a decline from 60,947 to 57,380. For the United States the drop was from 7,225 to 5,050; for Germany from 128,743 to 94,740. Italy, however, reported an increase from 69,500 to 72,400, and Sweden's total advanced from 63,130 to 68,480.

The total indicated horsepower of steam reciprocating engines under way in all countries combined, fell from 148,180 at the end of December to 143,924 at the end of March. During the same period, the total for Great Britain and Ireland increased slightly, going from 97,021 to 101,644.

For steam turbines, the returns show that the total for all countries decreased from 952,060 at the end of December to 910,360 shaft horsepower at the end of March. For Great Britain and Ireland, the decline was from 244,760 to 207,510; and for the United States, from 249,900 to 244,400. Italy's total remained unchanged at 237,000, while France shows a gain from 208,000 to 220,000.

In the standing of the various countries in tonnage production is given in the following table, the figures showing gross tons:

	Mar. 31, '32	Dec. 31, '31
Great Britain & Ireland	372,973	400,505
United States	206,703	207,837
Italy	181,821	178,287
France	156,760	164,440
Germany	103,885	103,981
Sweden	98,301	95,380
Holland	50,915	67,866
Japan	45,770	53,280
Spain	33,272	55,241
Denmark	24,265	51,800

Italy and Sweden are the only countries to show a gain in the volume of shipbuilding during the March quarter.

Of large ships, there are now eleven under way, as compared with twelve in the December quarter. Italy is building four vessels of 20,000 gross tons and upwards, each; Great Britain and Ireland, three, and the United States and France, two each.

William Newton Agnew, traffic manager of the Worthington Pump & Machinery Corp., New York, since 1910, and also assistant to the president for the past three years, died suddenly April 12 at his home in New York.

Lake Carriers Hold Annual Meeting

Little Demand for Tonnage in Sight

By A. H. Jansson

THE annual meeting of the Lake Carriers' association held at Cleveland, April 21, with prospects for the season of 1932 far below last year's operations, was characterized by a grim attitude of "let come what may" and a determination to exercise the strictest economies in order to survive. A realization of actualities is replacing unreasonable optimism, but with it there was apparent an impalpable feeling that the fighting spirit and the three o'clock in the morning courage of every vessel owner had materially improved. They are ready to fight stubbornly for their existence and there was no evidence at the meeting indicating any doubt of the outcome. Drastic retrenchment, however, is necessary and a resolution by the executive committee recommending minimum wage rates for this season calling for about 20 per cent reduction was unanimously adopted. Each individual company, it is understood has already very materially curtailed all overhead expenses including the pay of shore personnel from the top down.

The new wage scale afloat is still much better than that prevailing in these times on ocean ships and is as follows:

Wages	Per Month (30 days)
Combination wheelsman and watchman	$ 84.00
Wheelsman	81.00
Watchman	78.00
Deck Watch	70.50
Deckhand	60.00
Deck Engineer	96.00
Fireman and Oiler	75.00
Coal Passer	55.50
Chief Cook (over 4000 tons)	124.50
Chief Cook (under 4000 tons)	111.00
Second Cook	70.00
Second Cook	70.50
Porter	60.00

An attendance of 89.5 per cent of the membership of the Lake Carriers' association was represented at the annual meeting. The annual report which had been printed and sent out to members was approved without question. Officers of the association were re-elected as follows: Capt. Joseph S. Wood, president; L. C. Sabin, vice president; George A. Marr, vice president, secretary and treasurer and Newton D. Baker, general counsel. No material change was made in the board of directors or in the personnel of the executive committee and alternates with the exception that F. I. Kennedy succeeded J. E. McAlpine as an alternate, and W. J. Conners Jr. succeeded the late J. C. Evans as a member of the board and of the executive committee.

Captain Wood presided at the meeting and called for the annual report of the welfare committee headed by George M. Steinbrenner and of the shore captains' committee headed by Captain R. W. England. Mr. Steinbrenner pointed out that the work of the welfare committee had been actively carried on under the handicaps of existing conditions and that the work will be continued in spite of all difficulties.

Capt. R. W. England, chairman of of the shore captains' committee reported that the committee had held six regular meetings and that recommended loading drafts were assigned from time to time as lake water levels changed. For the beginning of this season, incidentally, the recommended draft is 18 feet, which is 9 inches less than the opening draft a year ago and one foot nine inches less than the opening draft two years ago. The up and down bound courses defined by the Lake Carriers were carefully observed which materially aided in the fine record made in the small number of accidents.

The shore captains' committee studied the hazard of oil tankers in harbors and had several conferences with owners of tankers with the result that the committee is of the opinion that the rules and regulations, which the oil companies themselves have laid down for safe navigation, are adequate as long as they are observed. The committee also considered questions in relation to the location and clearances of the proposed Main street bridge over the Cuyahoga river and with reference to channels and harbors of the Great Lakes.

It was pointed out that government radio beacons have been established at all points that appear to be desirable and that they have demonstrated their value not only in safe navigation but in an improvement in the time of passage of ships with safety. The change of many lights on the lakes to green meets with the approval of all masters.

The work of the shore captains' committee may be said to be reflected in the freedom from accidents and the large number of aids to navigation which have been established based on its reports and recommendations. The committee is of the opinion that vessel owners should call upon masters of their ships to insist on lifeboat drills and proper training in small boat work. In this connection it was pointed out that the coast guard personnel wherever located is qualified and willing to give instruction and it is up to the masters of the ships to see that their officers and crew are thoroughly drilled in this respect.

Chairman T. V. O'Connor of the

Diminishing Ore Cargoes

CARRYING ore has been the very life blood of lake shipping for many years. Low though the rates have been as compared with the charges per ton mile of bulk movements in other parts of the world, it has been the one commodity which has paid a return to the vessel owner whether independent or affiliated with the consumer. The terrific shrinkage in the total movement of ore is a cause for the greatest concern.

In the season of 1929 a total of 65,204,600 long tons of iron ore came down the Great Lakes in vessels; the record movement of ore for all times. In the season of 1930 the ore tonnage had declined to a total of 46,582,982 long tons; and for the season of 1931 the movement in ore had dropped to a total of 23,467,786. What the demands are to be for 1932 is more than problematic, no one knows; and estimates as low as 13,000,000 tons have been made.

With this paying cargo decimated it is going to be a matter of self-preservation for the vessel owners of the lakes to turn the transportation of other commodities into a profitable operation.

United States shipping board attended the meeting as a guest of the Lake Carriers. The meeting adjourned for lunch, after which the Great Lakes Protective association held its annual meeting.

Protective Association

THE Great Lakes Protective association is distinct from the Lake Carriers' association. It is composed entirely of members of that body. Either in person or by proxy 100 per cent of the membership attended. Members of the advisory committee were re-elected with the exception that George H. Warner was elected in place of A. F. Harvey, resigned. The advisory committee in a later meeting will elect the officers of the association and it is expected that no change will be made in the present roster. J. S. Ashley as chairman, presented a brief summing up of the annual report, copies of which were distributed to the advisory committee and a little later will be sent to all members.

The year 1931 was the twenty-third year since the inception of the association and the third year during which 50 per cent has been reserved from conventional insurance. The opening of the season was much earlier than is usually experienced on the lakes. Though due to economic conditions only a few vessels started operations when navigation opened. A few cargoes of coal were moved from Toledo to Detroit in March, but no general start was made until the latter part of April. Out of the 96 vessels in the association, 27 started in April, 23 in May, 7 in June, 8 in July, 5 in August, 2 in September and 1 in October.

Water levels in 1931 were considerably lower than in the previous year, averaging one foot five inches less in the St. Marys river and about one foot nine inches less in Lake St. Clair, which curtailed the cargo tonnage carried per trip. Weather conditions were better than normal throughout the year. The only gale of destructive force occurred on Nov. 5-6 when one vessel while proceeding from Lansing shoal to Milwaukee was damaged.

Losses for the year were somewhat below normal. Only 49 accidents were reported that will result in claims. On the whole there has been a marked reduction in disasters and from computations made when the annual report was in preparation there will be a return to subscribers of $250,279.76. The losses paid and estimated are computed at $120,488.71. This would make the rate of the association, including losses and expenses, under one per cent or to be specific 82.7 cents per $100. This rate includes not only the navigating risk, but the pre-season sailing risk, post-season and light lay-up trips, extra cost for mooring behind the Buffalo break wall and all risks that are subject to an additional rate. These returns do not include pre-season cover under which the association's vessels are sailing, but if there are no further losses during the final week still to be worked out under the 1931 certificates, these figures indicate quite accurately results of the year's operation.

The chairman urged the importance of extreme caution to avoid all damages in the present season and pointed out that if proper precaution is exercised the season of 1932 will show even better results than the very satisfactory conclusion reached in the 1931 account.

Several members expressed their opinion that due to what seemed to be some unnecessary overlapping, the expenses of inspection and surveys were larger than they should be and in the final analysis this was paid for by the vessel owner in the form of insurance. It was suggested that some way might be worked out whereby this duplication could be eliminated, thus reducing the cost. It is likely that a committee will be appointed to go fully and carefully into this matter.

The annual banquet of the Lake Carriers' association was held at the Hotel Cleveland on the evening of April 21. Capt. Joseph S. Wood, president of the Lake Carriers' association introduced Newton D. Baker, general counsel of the association who made the principal address and acted as toastmaster. Mr. Baker pointed out that since our civilization was founded on iron and steel, that the lake carriers could reasonably expect demands for their service to be among the very first to show improvement when the revival of business came. Though emphasizing the effect and counter-effect of economic relations among all nations, Mr. Baker was of the opinion that there was every reason to expect the United States to be the first, with perhaps a single exception, to recover.

Chairman T. V. O'Connor of the United States shipping board read a short and lifeless prepared address and then proceeded extemporaneously in a very effective manner to outline the progress made in building up a modern American merchant marine, pointing out that we are now the second maritime power in the world. He also touched upon the economies which the shipping board has put into effect so that for 1932 not only will the board not need to call for any appropriation, but that it is in a position to return to the federal treasury a sum of $3,000,000. He called attention to the effort which he thinks will be successful of having congress declare a moratorium on moneys owed the shipping board by shipping lines in order to save these lines from bankruptcy and the complete dislocation of the whole plan of encouragement to private ownership of a modern American merchant marine.

Officers

Lake Carriers' Association

President
JOSEPH S. WOOD

Vice President
L. C. SABIN

Vice President
Secretary and Treasurer
GEORGE A. MARR

General Counsel
NEWTON D. BAKER

Executive Committee

A. E. Cornelius, A. F. Harvey, C. L. Hutchinson, H. K. Oakes, A. E. R. Schneider, W. G. Stewart, G. A. Tomlinson, George H. Warner, H. S. Wilkinson, W. J. Conners Jr.

Alternates

J. Burton Ayres, J. J. Boland, H. G. Dalton, A. H. Ferbert, Warren C. Jones, John T. Kelly, F. I. Kennedy, Walton H. McGean, W. P. Schaufele, A. C. Sullivan.

Directors

Cleveland

J. S. Ashley, J. Burton Ayers, Newton D. Baker, S. B. Cady, C. C. Canfield, H. G. Dalton, R. W. England, A. H. Ferbert, A. F. Harvey, C. L. Hutchinson, Chas. O. Jenkins, Warren C. Jones, John T. Kelly, Geo. S. Kendrick, F. I. Kennedy, Geo. A. Marr, Walton H. McGean, H. K. Oakes, R. J. Paisley, C. J. Peck, L. C. Sabin, W. P. Schaufele, A. E. R. Schneider, Geo. M. Steinbrenner, W. G. Stewart, H. C. Strom, Baird Tewksbury, G. A. Tomlinson, R. B. Wallace, Geo. H. Warner, Joseph S. Wood.

From Other Cities

J. J. Boland, A. E. Cornelius, W. J. Conners Jr. and J. E. McAlpine of Buffalo; H. F. Hughes and A. C. Sullivan of Chicago; J. G. Munson of Rogers City; W. P. Snyder, Jr. of Pittsburgh and H. S. Wilkinson of New York.

New Lighthouse Completed

With the lighting of the new lighthouse at Cape Decision, Alaska, on March 15, the construction of which required many months, navigators were provided with a powerful light and fog signal at an important turning point. The lighthouse is on the southern extremity of Kuiu island.

Because of the prevalence of fog and the necessity for very careful navigation upon this rocky coast, the lighthouse has been equipped with both a fog signal and radiobeacon. The fog signal is an air tyfon sounding a group of two blasts every 30 seconds and is synchronized with the radio-beacon. The radio-beacon is an intermediate power station. In clear weather it will operate for two 10-minute periods each hour, and in fog it will broadcast for 60 seconds every third minute.

Lake Ore Shipping Is Affected by Greater Use of Scrap

By Alexander T. Wood

VESSEL owners on the Great Lakes are directly and adversely affected by the increasing use of iron and steel scrap in the production of steel. The production of steel in the United States has increased some 36 per cent in the past 20 years, while in contrast to this growth the production of iron ore has decreased 3 per cent. In view of the fact that it takes 1.85 tons of ore to make one ton of pig iron, it is seemingly a paradox that less ore was produced in 1931 than the total production of iron and steel.

This peculiar condition is due, not to imports of foreign ores, but to the tremendous increase in the use of iron and steel scrap. The amount of scrap consumed by the open hearth and blast furnaces has increased to an estimated yearly volume of 28,000,000 tons.

Approximately 85 per cent of the ore consumed in the United States is mined in the Lake Superior district. Except for small amounts of all rail shipments the entire production is shipped via the lakes to the consuming centers. It is therefore clear that the increasing use of scrap and the consequent reduced demand for ore even in normal times with steel production at a high point, has seriously affected the shipping industry of the Great Lakes.

In Table 1 the trend in consumption of lake ore in proportion to the total production of iron and steel is clearly evident. It will be noted that for the year 1929 the total lake ore consumed was 63,662,342 tons. Had the ratio remained the same as in 1920 the consumption of iron ore would have been 73,211,693 tons. The drop in the consumption of iron ore in proportion to the total production of iron and steel simply means that a great deal more iron ore was used to make one ton of steel in 1920 than in 1929, the difference being made up by the use of scrap. This difference represents a loss of nearly 10,000,000 tons of cargo to the vessel owner.

Anticipating a continued increase in the demand for the movement of iron ore from the Lake Superior district corresponding to the upward trend in steel consumption the lake shipping industry built up an organization capable of handling more than 85,000,000 tons of ore a season. This volume has never been attained and there is now a realization among ship-owners that the lake ore fleet has been over-developed in capacity.

TABLE I

Year	Total Iron and Steel	Total Lake Ore Consumed	Ratio Lake Ore to Total Iron and Steel
1920	50,259,115	57,153,886	1.14
1921	23,123,637	25,832,215	1.12
1922	41,168,260	40,975,775	1.00
1923	53,831,743	62,295,386	1.16
1924	45,166,420	45,978,221	1.02
1925	53,007,249	54,767,112	1.03
1926	56,455,761	58,359,015	1.03
1927	53,037,851	52,932,630	1.00
1928	58,561,637	56,823,322	.97
1929	64,258,562	63,662,342	.99

NO anticipated normal increase in demand for ore, even in years of plenty, will absorb the present lake fleet capacity according to the author's analysis. This is probably correct. However, an important point has not been touched upon. Many of the units of this fleet have long since passed, and others are rapidly approaching, the end of their normal replacement period. An obsolescent ship, like any obsolescent tool, is an economic liability because of the high cost of operation.

The real objective now should be the modernization of the ore carrying fleet. In the final analysis the successful vessel operator cannot ignore modern improvements and practice in naval architecture and marine engineering. Therefore in the years to come new ships must be built, ships that will give the most efficient service at the lowest possible cost. Why not begin an intensive study along these lines so that a plan of procedure can be prepared?

Editor's Note

With a total movement of only 23,467,786 tons of ore in 1931, the hope of operating an ore fleet at capacity can only be projected into the dim future.

Under these circumstances it is not strange therefore that shipowners on the Great Lakes have been seeking other uses for their freighters. In 1925 there were 363 vessels on the Great Lakes operated in the ore trade with a trip carrying capacity of 3,098,700 tons. In 1931 there were 335 vessels with a trip capacity of 2,807,900 tons. The difference represents a shrinkage of almost 10 per cent in number and about 8,000,000 tons in capacity.

Many of the ships listed as ore carriers in the accompanying Table II did not carry ore even in the record ore shipping year 1929. The withdrawals between 1925 and 1931 represent ships no longer available for carrying ore. Exclusive of ships sold to Canadian interests most of the withdrawals have been reconstructed for special trades. There has been a notable increase in the self-unloader type of vessel. Several ships have been remodeled to carry automobiles and not a few are now equipped to handle scrap.

TABLE II

Year	Number of Ore Carriers	Tons Capacity per Trip (19 foot draft)
1925	363	3,098,700
1926	357	2,862,900
1927	358	2,909,800
1928	346	2,847,000
1929	340	2,827,000
1930	335	2,807,900
1931	335	2,807,900

In view of the above outlined changing developments in the ore industry, the future of lake shipping in the ore carrying trade will not correspond with the fortunes of the steel industry. Until the ultimate effect of the use of scrap is established there is likely to be little new construction of ships for the ore trade.

The author, Alexander T. Wood, is connected with the Wilson Transit Co., Cleveland. Statistics quoted are taken from STEEL, article by A. J. Hain, Jan. 1, 1931, and from the Jan. 1, 1932 issue. Statistics on number and trip capacity of ore carriers were compiled by A. B. Kern, M. A. Hanna Co., Cleveland.

A bronze plaque has been awarded by the Standard Shipping Co. to the tanker E. T. BEDFORD, in recognition of her record of three years and three months without an accident involving loss of time of the personnel.

Diesel Electric Vessel for U.S. Public Health Service

THE United States public health service tug WALTER WYMAN, recently completed by the Spedden Shipbuilding Co., Inc., Baltimore, is the first diesel electric vessel to be built in that port. The vessel is now in commission and is attached to the United States quarantine station at Rose bank, Saten Island, N. Y. Her dimensions are 100 feet in length over all; 23 feet 1⅞ inches in beam over all; 14 feet 2½ inches in depth, and draft to bottom of keel at stern is 11 feet ½ inch when all tanks are full. The load displacement is 270 tons, the gross tonnage is 196 and the net tonnage is 133.

A unique feature is the use of Byers genuine wrought iron plates and Ulster wrought iron rivets for the entire hull below the water line. This material is used to insure maximum resistance to corrosion of the vessel's underbody. Above the water all construction is of steel. This vessel was designed in the office of the surgeon general, public health service, by P. W. Clark, naval architect.

The pilot house, located on the upper deck forward is fitted with duplicate pedestals permitting pilot house control of the main propulsion motor from either side of the pilot house. Steering can be done electrically or by hand at will. Windows in the rear of the pilot house make possible a practically unobstructed view of the entire horizon.

Interior Arrangements Convenient

A spacious saloon is located aft of the pilot house for the use of public health service doctors and inspectors in the line of duty in meeting ships, entering New York harbor from foreign ports which require quarantine inspection prior to entering United States ports, to prevent the possible introduction of dangerous, contagious and exotic pestilential diseases.

On the main deck forward there is a roomy and comfortable saloon for the use of passengers detained at quarantine in cases where quarantinable disease has broken out on an incoming ship. Aft of this space are located two toilets and a hospital for six injured or sick persons who may be brought in on an incoming ship. Directly aft of the hospital is the machinery casing. At the stern is a space for transporting freight and supplies or for steerage passengers ordered detained at quarantine due to conditions found on board.

Below the main deck, the hull exclusive of peak tanks, is devoted to machinery space with ample room, light and air. The machinery consists of two 5-cylinder, 12 by 15 inches Fairbanks-Morse diesel engines operating at 300 revolutions per minute with a total of 650 horsepower. The exhaust from the diesel engines passes through individual mufflers. Each diesel engine is connected by a flexible coupling to a 205 kilowatts, direct current Westinghouse generator. Each generator develops 820 amperes at 250 volts full load and 300 revolutions per minute. Forward of the generators are located individual 125-volt Westinghouse exciters of 25 kilowatts capacity each at 300 revolutions per minute.

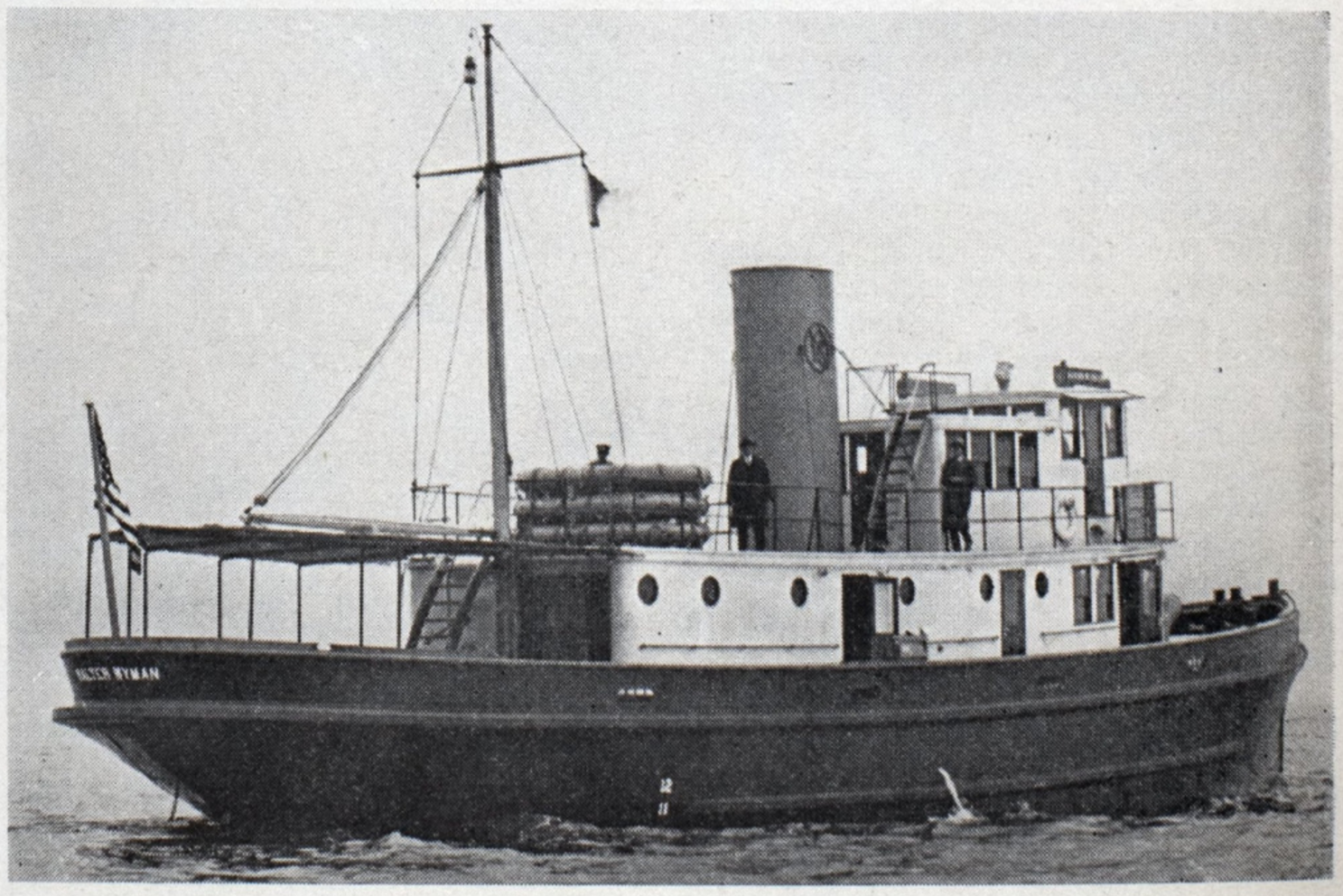
Main Propulsion Motor

The main propulsion motor supplied by Westinghouse is of double armature type with each armature developing 250 horsepower. This motor takes a full load amperage of 818 at 175 revolutions per minute and can be controlled either from the pilot house or from the engine room merely by throwing a switch. The propeller is a three-bladed bronze wheel supplied by the Columbian Bronze Corp. with 96 inches pitch and 96 inches diameter. Trial results demonstrated the correctness of the characteristics of the propeller. Full power was absorbed with the motor turning at 180 revolutions per minute and developing 557 horsepower. With a speed of 11.7 knots under these conditions, the maximum apparent propeller slip was 17.7 per cent.

The official acceptance trials were run on the measured mile course off Kent island in Chesapeake bay. During the trials the machinery was operated from practically no load up to 100 per cent load with the results mentioned above. It was calculated that the efficiency of the main propulsion motor is 92.4 per cent, giving a loss from all causes of 45.6 horsepower.

On the delivery trip to New York, with only one diesel electric unit working for a short period, it was found that sufficient current could be generated to turn the main motor at 140 revolutions per minute. In other words, when working under overload conditions, one diesel generating set was able to supply sufficient current to operate the main propulsion motor within 20 per cent of its normal rated speed for full power with both generators in commission. From this it is apparent that working both generating units at overload an appreciable increase in propeller revolutions might be anticipated. A Kingsbury thrust bearing, size 17, is fitted on the main propeller shaft just aft of the propulsion motor.

Among the auxiliaries are a combination Fairbanks-Morse diesel driven generator and compressor set of 20 kilowatts capacity at 125 volts and 800 revolutions per minute. This set furnishes electricity for auxiliary purposes as required, or the 50 cubic foot compressor will furnish ample supply of starting air for the main engines. This air is stored in a battery of six large air tanks. The fire and bilge pump is an electric motor driven Fairbanks-Morse reciprocating pump, 3½ by 6 inches. The same company also supplied an electrically driven emergency oil and water pump for transferring oil or water, or for gradual cooling of the main engines after a long run, by circulating water and oil through the cooling system of each motor.



Walter Wyman-Diesel Electric Tug Built by Spedden Shipbuilding Co. for United States Public Health Service, Foreign Quarantine Division

A Powerful Suction Dredge for Mississippi Service

By W. G. Gude

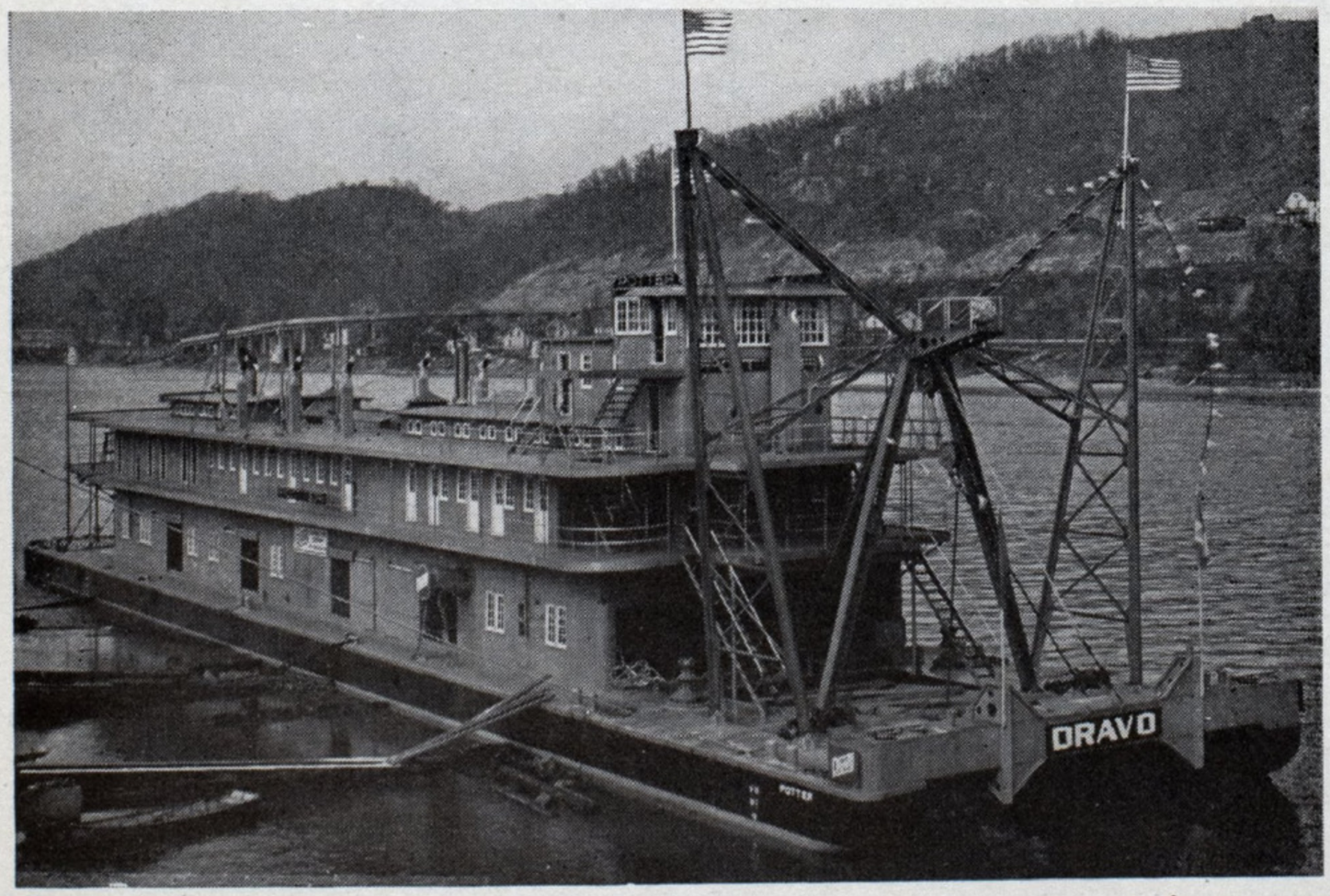
ONE of the most powerful inland water dredges ever constructed was launched Feb. 26 by The Dravo Contracting Co., Neville Island, Pittsburgh. This was the dredge POTTER, built for the United States engineer office at Memphis, Tenn., and to be used for channel maintenance in the Mississippi river between Cairo, Ill., and the mouth of the Arkansas. The OCKERSON, a dredge of similar construction, also is being built by Dravo.

The POTTER, one of eight similar dredges completed and to be built, is designed to cope with the sand bars which build up rapidly in the Mississippi river during high water and is capable of removing from 1600 to 2200 cubic yards of material per hour from the crossing. This will permit the opening of the bars in from 36 to 72 hours. The dredge is 214 feet long, of all-steel construction, has a molded beam of 46 feet, a molded depth of 9 feet but will draw only 5 feet of water. Propulsion is by means of twin screws operating in tunnels.

Propelling engines were built by the Nordberg Mfg. Co., Milwaukee, and consist of two 950 brake horsepower steam reciprocating engines. The main dredging pump is driven by a Moore steam turbine developing 1250 brake horsepower at 3600 revolutions per minute. Power is delivered to the pump shaft through a double reduction gear furnished by the Falk Co., Milwaukee, giving a pump speed of 175 revolutions per minute. The turbine is designed to operate, on steam at 225 pounds pressure with 150 degrees Fahr. superheat, and a vacuum of 28 inches. Condensers are of C. H. Wheeler Mfg. Co. manufacture. Oil is used for fuel in the two water tube boilers, each of which has 4200 square feet of heating surface. They were built by the Foster Wheeler Corp.

Dredging in Mississippi River

The POTTER was designed under the immediate supervision of Brig. Gen. T. H. Jackson, president of the Mississippi River Commission, by J. W. Gerell, senior engineer, and is of a type peculiar to the Mississippi river. It will move under its own power to the crossing or bars to be dredged and is then moved by means of cables 3500 feet long reeled on powerful winches. Piles are sunk at the upper end of a shallow crossing and the dredge allowed to float downstream to the lower end of the crossing. The 32-foot suction head then is lowered to the bottom of the river and powerful jets of water started which agitate the sand immediately under the suction head. The sand then is pumped in a manner similar to the action of a vacuum cleaner through a floating pipe line and discharged to the side of the channel. The first cut through the bar rapidly increases the velocity in the cut and the scouring action of the river aids the dredge in obtaining a suitable channel.



The Potter, One of Two Similar Powerful Suction Dredges Built by The Dravo Contracting Co. for the United States Engineers

Specially designed steel piling is required for this operation. The 40-foot piling, after connecting the ends of the cables, are lifted by pile derricks. The dredge is brought to the proper location and a heavy spud dropped to the bottom of the river to hold the dredge in position. The first pile then is dropped into the river and jetted down into the bed about 20 feet. The spud is raised and the dredge moved to the location for the second pile, after which the dredge drops downstream with the current, its position being controlled by means of the cables attached to the piles. Two powerful hauling winches mounted on the forward deck are required to control this operation and also are used in pulling the dredge forward after the suction head has been lowered and dredging is in progress. The winches are able to pull the dredge forward at a speed of not less than 300 feet per minute.

Special Design Centrifugal Pump

The suction heads on the POTTER are the largest ever constructed, being 32 feet wide and having a clear opening 11 inches x 32 feet through which the sand and water are pumped. The ladder holding the suction head is 21 feet 3 inches in length, permitting dredging to a depth of about 20 feet. On the under side of the suction head are 34 water jets designed to agitate the sand and increase the amount of material pumped. Water for these jets is furnished by a 16-inch, turbine-driven, centrifugal pump.

Quarters are provided on the dredge for a crew of about 40 men and include all facilities for furnishing comfortable living quarters for the men who must stay on the boat for several weeks at a time.

The main pump is the design of the office of the chief of engineers, United States army. The casing is set low in the hull to reduce priming difficulties. It has a 34-inch single suction pipe and a 32-inch discharge pipe. The impeller is 80 inches in diameter. Discharge from the pump is carried overhead with a special design fitted to permit side discharge on either side of the dredge. A 32-inch discharge pipe, 400 to 600 feet in length, will be used with the dredge. A baffle plate on the last section of pipe will cause a water reaction and permit the discharge of material 300 to 500 feet from the axis of the cut.

The dredge POTTER is named after Gen. Charles L. Potter, corps of engineers, United States army, who at the time of his death in 1928 was division engineer, western division, and president of the Mississippi River commission. Formerly he had been district engineer at Vicksburg, Miss., 1899 to 1903, and secretary of the Mississippi River commission, 1910 to 1911. C. D. Ferguson has been named master of the dredge, with William Hamilton as chief engineer.

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

IN FOG collision cases, the duty of care is met if the vessel is under such control that she can reverse her engines and come to a standstill in time to avoid colliding with a vessel or object which she ought to see, having regard to the fog density. The rule does not require that the vessel must always stop in a fog.—JOHN F. LEWIS, 51 F. (2d) 274.

* * *

THE consignee of a grain cargo, required to unload the vessel, is bound to exercise due diligence under the circumstances and the custom of the port to discharge the vessel as speedily as possible. Damages can only be recovered upon proof that the delay complained of was due to some fault or negligence on the part of the consignee. What is a reasonable delay in unloading a ship depends upon the surrounding circumstances.—Kinsman Transit Co. v. 50,000 Bushels of Wheat, 51 F. (2d) 377.

* * *

DEMURRAGE will only be allowed when profits have actually been, or may be reasonably supposed to have been, lost, and the amount of such profits is proven with reasonable certainty. There must be a pecuniary loss, or at least a reasonable certainty of pecuniary loss, and not a mere inconvenience arising from an inability to use the vessel. It has been the general understanding in this country that damages for detention are not recoverable in collision cases without proof of actual pecuniary loss caused thereby—Atchison, T. & S. F. Ry. Co. v. California Sea Products Co., 51 F. (2d) 466.

* * *

WITH reference to assumption of risk by employes, it was said in CALVERT, 51 F. (2d) 494, that "it is clear from statute and decision that it applies in admiralty, but under the terms of the Merchant Marine Act of 1920, the act of a seaman in assuming the risk must have been voluntary and not under restraint. It would be an extremely harsh application of this rule and one which we believe has never been invoked by a court of admirality, to hold that a master of a vessel assumed the risk of the unseaworthiness of a vessel by continuing in the employ of a company whose duty it was to see that the vessel was seaworthy. * * We have never understood that the mere knowledge on the part of a bargeman that a vessel was leaking somewhat and his continued employment with this knowledge makes out the defense of assumption of risk against damage due to a general unseaworthy condition. Assumption of risk involves the ready and willing acceptance of risks which are known and thoroughly appreciated."

* * *

THE test of seaworthiness is whether the vessel is reasonably fit to carry the cargo undertaken to be carried. "Seaworthiness" is given a wider application than the word itself imports. The first thing one thinks of in connection with seaworthiness is the condition of the hull and the equipment; but it has long been settled that a vessel may also be rendered unseaworthy because of bad stowage. Unseaworthiness may also result from careless use of good equipment before the vessel breaks ground. A tank barge so laden that it has only two feet freeboard is not seaworthy where the hatches are not securely fastened when the vessel is ready to sail. A tank barge light is doubtless seaworthy with hatches left open, but the same cannot be said of a loaded barge.—FRED E. HASLER, 51 F. (2d) 779.

* * *

A CHARTERER, bound to pay stevedoring charges, has no power to bind the shipowner.—C. F. Starita Co. Inc. v. Compagnie Havraise Peninsulaire de Navigation a Vapeur, 52 F. (2d) 58.

* * *

THE federal statutes of limitation of liability are designed to protect shipowners who, in the business of sending ships down to the sea, make them shipshape for the voyage. In a case of a master undertaking to pay for repairing an abandoned vessel under a profit-sharing arrangement with the owner, it requires the clearest kind of proof that everything was done which was necessary to fit her out.—In re Jacobson, 52 F. (2d) 178.

* * *

BY THE maritime law a seaman who falls sick or is wounded in the service of the ship has always been entitled to "wages, maintenance and cure"—that is, care, not a positive cure, which may indeed be impossible. If a breach of the obligation to care for the sick or wounded seaman aggravated his condition and resulted, for example, in the amputation of a limb or in permanent disability, he could recover not only expenses for medical treatment, but compensatory damages as well. But if death resulted, no action lay, for neither the general maritime law nor the common law gave an action for the death of a person. Nor does the Jones act provide a remedy for death resulting from an illness which occurred without fault on the part of the ship but was aggravated by a failure to perform the ship's maritime duty to provide cure.—Cortes v. Baltimore Insular line, 52 F. (2d) 22.

* * *

SEAWORTHINESS is to be determined when the ship breaks ground and is measured by her fitness in all respects to fulfill the purposes of the voyage as then contemplated. Seaworthiness is further determined upon the facts and circumstances in each particular case.—Erie & St. Lawrence Corp. v. Barnes-Ames Co., 52 F. (2d) 217.

* * *

ONE whose ship has been injured may, against the wrongdoer, liquidate his damages by expert testimony and never repair his vessel. But owing to the necessary looseness of such method of proof, recourse should only be had to it in cases of special circumstances which necessitate a departure from the ordinary rule. The normal method of proving physical damage is to show exactly what repairs were made and what those repairs cost.—MOLLIE SCULLY, 52 F. (2d) 239.

* * *

THE general rule in the United States is that, unless otherwise stipulated, prepaid freight must be returned to the shipper if the goods do not arrive. If, however, the voyage is interrupted by a peril of the sea which necessitates repairs to the vessel, the shipowner has a lien on the cargo for the earning of the freight, and has a right to carry the cargo forward by his vessel or some other conveyance and deliver it and receive his full freight. The shipowner is entitled to a reasonable time within which to repair the vessel.—FREDENSBRO, 52 F. (2d) 854.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	332	1,982,670	375	2,070,546
February,	312	1,875,981	322	1,776,394
January	297	1,821,335	305	1,719,978
December	314	1,692,258	343	1,744,190
November	304	1,564,284	308	1,542,849
October	309	1,626,094	322	1,708,560
September	523	2,724,761	522	2,641,711
August	541	2,785,703	531	2,739,919
July	538	2,626,814	563	2,754,107
June, 1931	541	2,747,134	526	2,596,749

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	57	186,479	45	151,190
February	49	150,899	34	98,667
January	51	168,266	36	114,982
December	58	180,172	42	132,734
November	52	148,335	37	111,969
October	69	192,159	57	160,609
September	66	172,313	54	155,113
August	81	208,854	59	147,948
July	76	201,677	59	155,114
June, 1931	75	218,611	50	127,906

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	99	319,863	65	217,992
February	107	315,036	63	213,166
January	94	286,508	61	208,491
December	102	313,977	65	240,908
November	75	241,142	52	166,786
October	98	325,261	66	241,072
September	109	339,482	78	263,783
August	131	388,799	98	305,488
July	131	362,111	94	290,733
June, 1931	130	347,787	97	264,467

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	14	41,083	13	35,993
February	20	53,793	20	56,558
January	13	28,179	14	28,955
December	18	38,860	18	37,319
November	17	40,991	19	47,514
October	17	39,060	16	34,195
September	27	48,534	26	52,035
August	29	50,249	23	39,273
July	24	52,979	22	52,945
June, 1931	17	28,216	17	26,397

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	8	35,293	5	24,289
February	5	19,442	4	18,533
January	8	41,147	4	21,654
December	11	41,268	4	17,037
November	9	35,826	5	18,040
October	6	23,833	6	23,836
September	6	20,330	3	11,160
August	10	41,671	3	12,240
July	6	25,062	7	30,748
June, 1931	6	21,104	3	12,211

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	....	.....	....	.....
February	32	127,810	36	149,417
January	27	112,542	42	168,762
December	29	114,184	40	154,060
November	26	103,835	47	182,585
October	36	144,875	54	207,518
September	32	126,256	49	199,803
August	29	114,582	31	119,968
July	28	107,694	48	174,226
June, 1931	30	116,953	35	139,799

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	96	288,052	105	319,511
February	105	337,487	98	323,603
January	95	301,958	102	328,876
December	102	330,709	106	354,320
November	99	304,138	98	314,109
October	116	388,308	111	385,136
September	111	350,556	117	362,970
August	122	374,434	118	377,085
July	125	393,553	120	379,526
June, 1931	127	376,049	114	338,066

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	33	79,948	42	99,939
February	22	68,136	48	121,647
January	17	53,536	38	104,392
December	30	95,762	38	110,614
November	23	77,075	47	113,416
October	25	76,385	54	146,995
September	24	72,333	47	104,255
August	21	59,408	54	127,864
July	31	77,082	63	149,665
June, 1931	39	108,710	59	167,488

Jacksonville

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	8	15,560	13	26,457
February	8	18,785	10	21,812
January	8	26,601	12	27,759
December	12	25,453	10	21,501
November	6	14,295	8	22,180
October	10	25,659	9	17,710
September	6	12,463	8	18,888
August	21	61,439	24	70,922
July	9	18,703	5	9,297
June, 1931	11	24,902	13	24,517

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	41	61,078	39	59,069
February	39	59,334	39	66,392
January	43	67,913	42	71,873
December	39	68,392	40	73,365
November	40	53,752	42	53,497
October	37	57,588	37	59,408
September	36	54,012	35	55,610
August	37	56,505	37	56,505
July	39	59,268	41	62,526
June, 1931	63	81,660	63	86,349

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	97	204,645	98	211,921
February	101	235,846	96	219,215
January	110	253,792	112	242,378
December	98	226,656	85	214,395
November	100	214,204	87	189,474
October	118	251,661	112	253,721
September	104	213,204	102	226,192
August	113	217,541	97	194,678
July	101	229,960	92	212,634
June, 1931	88	197,952	93	217,151

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	43	190,082	43	180,862
February	50	217,837	54	232,138
January	48	200,281	50	216,819
December	50	218,018	48	204,111
November	48	209,655	50	215,614
October	61	257,329	62	267,366
September	52	229,687	50	217,517
August	48	202,879	51	213,091
July	46	207,651	50	222,816
June, 1931	52	220,915	52	223,750

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	....	.....	....	.....
February	157	436,882	169	469,296
January	171	516,707	171	506,411
December	169	482,802	170	504,981
November	173	498,800	169	483,099
October	174	502,867	195	563,095
September	171	474,876	179	508,560
August	179	484,245	172	474,230
July	184	539,810	172	509,475
June, 1931	193	561,399	190	562,090

Charleston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net. tonnage	—Clearances— No. ships	Net tonnage
March, 1932	37	131,723	36	110,353
February	32	88,616	27	75,262
January	24	73,488	22	16,217
December	37	108,083	35	96,490
November	19	31,125	11	35,588
October	20	49,738	22	55,371
September	16	29,428	11	19,111
August	9	18,293	7	6,274
July	13	26,985	10	20,974
June, 1931	10	23,571	9	21,074

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	32	61,079	109	319,013
February	27	64,866	101	317,095
January	26	73,215	92	292,274
December	37	113,327	111	358,950
November	33	81,906	101	328,883
October	35	80,748	112	354,607
September	27	63,896	99	320,127
August	39	85,793	79	234,583
July	46	107,008	75	226,381
June, 1931	35	66,342	73	205,074

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	168	622,067	188	611,770
February	164	627,876	158	622,730
January	144	578,699	149	594,384
December	153	517,165	136	506,985
November	147	503,238	142	535,870
October	215	720,162	193	678,776
September	199	580,683	196	593,882
August	199	673,223	204	676,036
July	170	622,694	176	636,440
June, 1931	179	659,029	149	568,208

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	139	645,331	162	709,778
February	149	638,222	144	583,030
January	145	635,218	147	646,987
December	155	649,915	122	579,608
November	167	688,934	149	614,482
October	167	688,934	149	614,482
September	158	658,088	159	673,120
August	140	636,189	160	665,108
July	173	743,588	155	679,657
June, 1931	159	663,047	155	634,838

Houston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1932	27	113,624	43	167,956
February	25	103,589	43	162,236
January	25	108,322	36	145,084
December	26	99,354	42	148,568
November	34	139,899	62	225,833
October	28	126,071	52	194,114
September	34	132,684	45	163,144
August	31	127,112	44	163,103
July	35	148,988	45	178,091
June, 1931	23	115,140	38	139,102

Note: The figures given in this table are for direct entrances and clearances. Additional vessels in foreign trade enter and clear from and to other American ports after original entry and before final departure. At the port of Philadelphia, for instance, additional vessels in the foreign trade in this category were 55 of 187,175 net tons entered and 52 of 177,707 net tons cleared for the month of March.

Relief Is Voted on Ship Construction Loans

The amended Lehlbach resolution to permit a three-year moratorium on ship construction loans was reported favorably on April 11 by the house Merchant Marine committee This resolution, proposed by the shipping board to enable it to act on pending cases, was reported to the house for action.

The committee's amendment limits the moratorium period to three years instead of five as provided under the original measure. The resolution provides that the authorization shall remain in effect for a period of two years from the date of enactment. It retains the 5½ per cent interest charge on extensions. As amended by the committee the Lehlbach resolution reads:

"Resolved, that the shipping board be and is hereby authorized and empowered, the provisions of any statutes to the contrary notwithstanding, to extend, reaarange or hold in abeyance any payment or payments due the government from borrowers from the construction fund where it appears to the board that the best interests of the government are served thereby.

"This authorization is to be in force and effect for a period of two years from the enactment of this resolution, and such payments may be extended during a period of three years or less. Such extensions shall carry interest at a rate not less than 5½ per centum per annum."

The annual dinner of the American Society of Naval Engineers is tentatively scheduled for May 14 at the New Willard hotel, Washington, at 7:30 P.M. This dinner being the only occasion during the year which brings members of the Society together, a large attendance is desirable. Personal guests are welcome. Reservations should be made immediately.

Council Elects Officers

Officers of the National Council of American Shipbuilders were re-elected at the annual meeting held in the Whitehall club, New York, on April 21. Eight directors were re-elected for two-year terms and the members of the executive committee were re-elected for the coming year.

The officers are: H. G. Smith, president; Roger Williams, vice president; H. O. Hunter, counsel-treasurer; C. C. Knerr, secretary.

Directors elected for two-year term, representing individual members: William S. Newell, Bath Iron Works Corp.; Warren Johnson, Johnson Iron Works, Dry Dock & Shipbuilding Co.; George W. Roper, Norfolk Shipbuilding & Dry Dock Co.; C. Stewart Lee, Pusey & Jones Corp.; L. Y. Spear, Electric Boat Co.

Directors representing allied industry members, two-year term: D. W. Niven, General Electric Co.; I. W. Jackman, Worthington Pump & Machinery Corp.; R. L. Tomlinson, Brunswick-Kroeschell Co.

Executive committee, one-year term: Roger Williams, C L. Bardo, Robert Haig, George H. Bates and C. W. Middleton.

Claims New Pacific Record

A new record for the steamship run between Yokohama and San Francisco was claimed for the new turbine-electric driven Dollar liner PRESIDENT COOLIDGE, when on April 4 she completed the second homeward crossing in regular service in 12 days and eight minutes. This was four hours and four minutes faster than the previous record, held by the Japanese mail liner ASAMA MARU.

The PRESIDENT COOLIDGE, which is the largest turbine-electric drive ship afloat, sailed from New York for San Francisco on her maiden voyage on Oct. 15, 1931. On her first trip from San Francisco to Yokohama in the run was made in 11 days, four hours, and twenty-two minutes.

The vessel is driven by 26,500 shaft horsepower, twin-screw Westinghouse turbine-electric machinery. The propulsion plant consists of two 13,250 horsepower synchronous motors coupled directly to two alternating-current generators.

Sales Manager Dies

Fred H. Thomas, vice president and general sales manager of the Cooper-Bessemer Corp., Mt. Vernon, O., died of heart failure on March 27 after a four months' illness.

Mr. Thomas joined the former C. & G. Cooper Co. in 1907 and for the past 15 years has been vice president and general sales manager of the Cooper-Bessemer Corp. which resulted from the consolidation of the C. & G. Cooper Co. and the Bessemer Gas Engine Co., both builders of gas and oil engines and compressors.

T. F. Hudgins, vice president and western sales manager, has been appointed to succeed Mr. Thomas as general sales manager. Mr. Hudgins joined the former C. & G. Cooper Co. in 1923 and has been in charge of all sales west of the Mississippi river.

The Pittsburgh Equitable Meter Co., manufacturer of meters and regulators, recently has acquired all the capital stock of the Merco Nordstrom Valve Co. and the latter will hereafter operate as a division of the Pittsburgh company. W. F. Rockwell of the Pittsburgh company has been made president of the Merco company and the sales offices of each company will be available to the other.

Board Disposes of Lines to Private Operators

The shipping board April 19 took action to dispose of the remaining government-owned steamship lines operating from Gulf ports in approving the recommendation of the Merchant Fleet Corp. to accept the offer of Lykes Bros.-Ripley Steamship Co. and Tampa Interocean Steamship Co. to purchase the four remaining shipping board Gulf lines, provided an ocean mail contract is awarded. The lines are to be placed under one management under the recent plan of consolidation. The transfer of the lines to private ownership will eliminate an expenditure by the board in excess of $3,000,000 per annum.

The consolidation plan, pending award of a mail contract, involves a merging immediately of the following lines, which will be maintained, however, under the same trade names: American Gulf Orient line, operated by the Tampa Interocean Steamship Company from Gulf ports to China, Japan and Philippine Islands, with eight vessels. Dixie Mediterranean line, operated by the Dixie Steamship Co. Inc., from South Atlantic and Gulf ports to Mediterranean, Adriatic and Black Sea ports, with nine vessels. Dixie U. K. line, operated by the Dixie Steamship Co., Inc., from New Orleans and Texas ports to the United Kingdom and Irish ports, with eighteen vessels. Southern States line, operated by Lykes Bros.-Ripley Steamship Co. from Gulf ports to Havre, Dunkirk, Rotterdam, Bremen and Hamburg, with 29 vessels.

The present managing operators of the four lines are now interrelated through stock ownership and control and the consolidation under one management, with Lykes Bros.-Ripley Steamship Co. as managing operator, will involve only slight rearrangement among the Gulf steamship interests.

The purchasers will acquire 55 of the 64 vessels now assigned to these four services at $5 per deadweight ton, "as is, where is", or a total cost of approximately $2,500,000.

Chamber To Hold Meeting

The twentieth annual meeting of the Chamber of Commerce of the United States will be held in San Francisco May 17 to 20. Included in the various discussions dealing with the outstanding problems of American foreign and domestic trade will be a round table discussion on "Overseas and Coastal Shipping" on the afternoon of May 18, at which time the present problems of overseas shipping, the importance of American shipping to our trade and travel, and intercoastal shipping problems will be taken up.

New Two-Cycle Diesel Engine Designed for Marine Use

A NEW two-cycle full diesel engine suitable for marine service has been brought out by the Bolinders Co., manufacturer since 1893 of the well known two-cycle, low pressure, oil engine widely used in small vessels the world over. The low pressure engine in sizes under 500 brake horsepower totals over 1,000,000 horsepower in operation. This company is now embarking on a program to build larger units up to 1000 brake horsepower in the higher pressure two-cycle full diesel engine. Several features are incorporated in this new engine which it is claimed will facilitate operation and reduce operating cost.

The fuel consumption is said to be only 0.38 pound of fuel per brake horsepower per hour in sizes down to 200 brake horsepower. Lubricating oil consumption is one gallon per 1700 brake horsepower hours. Solid injection is used and a scavenging pump is built into the engine at the forward end. The flywheel is located aft and a Kingsbury type thrust bearing is fitted outside of it. Circulating and bilge pumps are located centrally and are easily accessible. A two-stage air compressor placed at the extreme forward end serves to charge the air starting tanks when the engine is running. The engine is designed on the enclosed straight line principle.

Forced Feed Lubrication

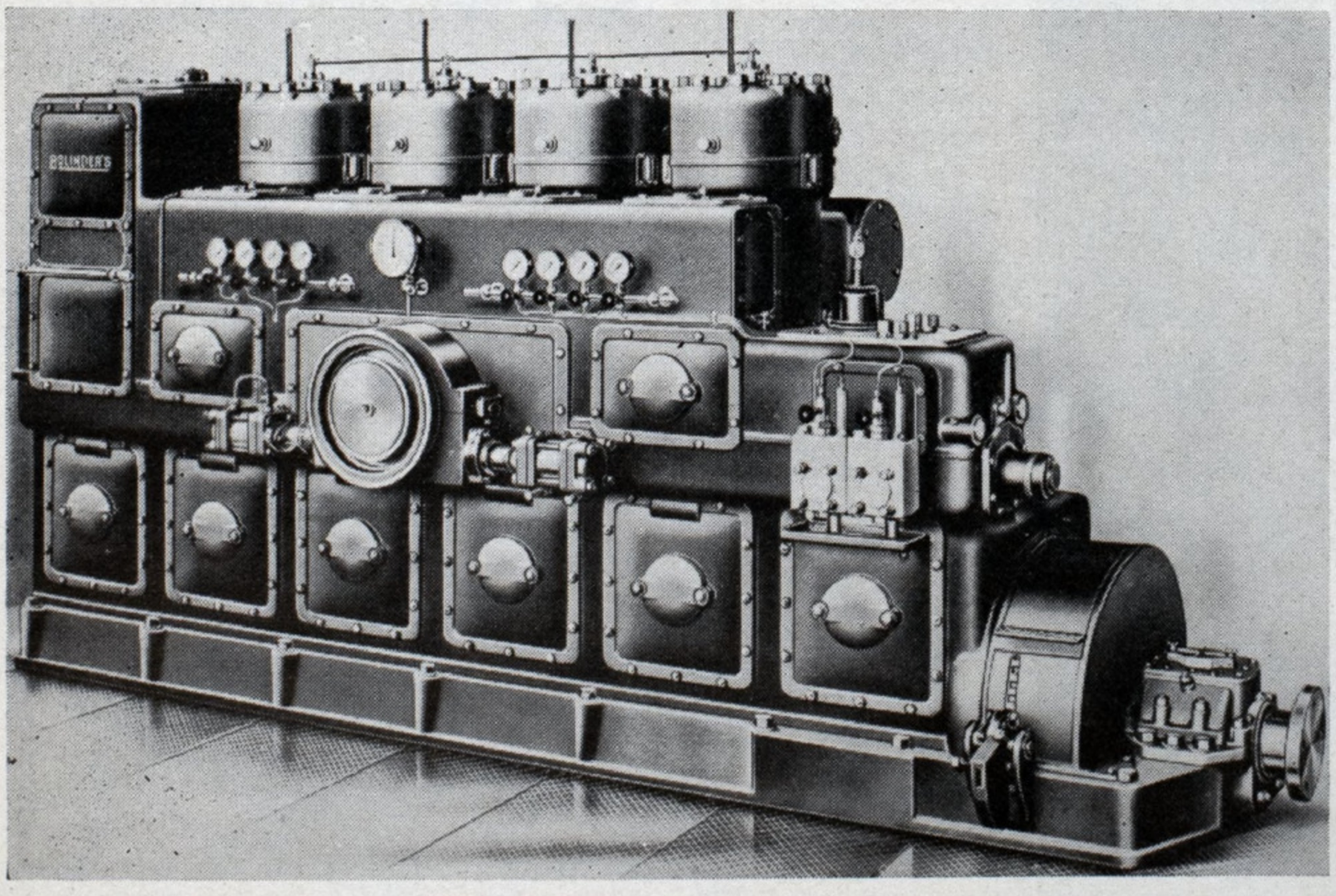
Forced feed lubrication with semi-dry crank case is used. The lubricant passes from the pump through a filter to the main and crank pin bearings, then up through the rods to the wrist pin bearings and returns to the crank case sump. Cylinders are lubricated by separate lines.

Removable cylinder liners are used. The water jacket is sealed by copper gaskets. Pistons are oil cooled. The oil cooling and lubricating systems are separate. Telescopic pipes carry the oil to and from the pistons and then through a cooler in the bilge.

A double scavenging method is employed. Two sets of air intake ports, one above the other, and opposite the exhaust opening are provided in each cylinder. The top set of air inlets, which slant upward, is controlled by valves. In this way the air blast is directed upward. Thus not only are the exhaust gases driven out more effectively, but the cylinder is super charged because these upper ports remain open an instant during the compression stroke after the exhaust opening has been closed by the piston. This undoubtedly contributes to the low fuel consumption.

Single orifice fuel injectors are used. Grooves cut tangentially in a conical spindle set the fuel whirling before it is forced through the orifice which is a hole 1/32-inch in diameter. Any waste matter reaching the single hole nozzle will pass through and not stick and carbonize.

An even speed is maintained by a centrifugal governor which controls the spill valves on the fuel pumps. The pumps, one for each cylinder, have constant strokes. The ahead and astern timing is accomplished by a sliding camshaft operated by a Servo compressed air motor.



New Bolinders Two-cycle Full Diesel Engine—400 *B.H.P. at* 250 *R.P.M.*

To reduce the stresses due to thermal and mechanical forces the cylinder head is symmetrical with the same thickness of wall all around. An open type of combustion chamber is used to give the highest efficiency.

Simple Method of Maneuvering

The engine is completely maneuvered by a single control. It is started, stopped and reversed and its speed is regulated by one hand wheel located on the side. This wheel operates the compressed air motor actuating the sliding camshaft. In starting the engine a slight turn of the hand wheel admits air to only two of all cylinders in position to start. If the pistons of these two are on top and bottom center, a further movement of the wheel allows the air to enter the remaining cylinders, assuring a positive turnover. Since dead center position is unusual, the engine may nearly always be started on two cylinders with a saving in air which would otherwise be wasted in passing out through the exhaust ports.

The efficiency of this method of starting was demonstrated in the handling of a tug powered with a 500 brake horsepower engine of this design. The tug was started, stopped and reversed continuously for two hours without use of any auxiliary compressed air, the compressor on the engine maintaining maneuvering pressure throughout the test. Changing from full speed ahead to full speed astern required only five seconds.

Indicating Instruments in Full View

Indicating instruments are located in full view of the operator. A tachometer gives the revolutions and direction of rotation. Pressure gages are provided for lubricating oil, cooling oil, starting air, scavenging air, and in the fuel lines to the injectors. Thermometers indicate the water jacket temperature in the head, and the piston cooling oil temperature.

Specifications of a four-cylinder engine (see accompanying illustration) similar to the engine in a tugboat which has been undergoing severe tests for the last year are: Bore, 13 inches; stroke, 19 inches; 400, 450 and 500 brake horsepower, respectively at 250, 275, and 300 revolutions per minute. The cranks are located at 90 degrees; length of engine, 18 feet 4 inches; width, 4 feet 3 inches; height, 7 feet 11 inches; weight, 57,000 pounds.

The gross earnings of the Canada Steamship Lines Ltd., for 1931 were $9,558,809, the lowest for the last 16 years. Contrasting this with 1928, there has been a shrinkage of 46 per cent. Despite the reduced earnings, the bonded indebtedness was lowered by $578,000 through the operation of sinking fund, while the bank debt was reduced $250,000.

Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let—Shipping Board Loans Made, Authorized or Pending

CHANGES in the original construction plans of the 30,000-ton liner MANHATTAN, building by the New York Shipbuilding Co., Camden, N. J., for the United States Lines Inc., will delay the entrance of the vessel into service until the latter part of September or early in October. The yard has been granted an extension of 45 days in which to complete the work. The illustration at the bottom of this page shows work proceeding on the MANHATTAN.

Alterations in the plans consist of installing 87 additional private baths, and the extension of the promenade deck completely around the ship.

Construction of the MANHATTAN is well advanced with both funnels in place and installation of the wood paneling under way. Boilers and machinery were installed several months ago.

Construction of the sistership is going ahead at the same yard and it is expected that this vessel, still unnamed, will be ready for service late this year or early in 1933.

Patrol Boat Contract Award

On Mar. 10, the John H. Mathis Co., Camden, N. J. was awarded the contract for construction of two 165-foot coast guard patrol boats on a bid of $174,000 per boat.

Other companies, together with their bids were as follows: Bath Iron Works Corp., Bath, Me., $175,616 to $185,551, depending on propelling equipment; Marietta Mfg. Co., Pt. Pleasant W. Va., $185,000; Maryland Dry Dock Co., Baltimore, $187,371 to $198,472, depending on propelling equipment; Electric Boat Co., Groton, Conn., $189,700; New York Shipbuilding Co., Camden, N. J., $190,000; Tampa Shipbuilding and Eng. Co., Tampa, Fla., $198,000; Pusey & Jones Corp., Wilmington, Del., $204,000; United Dry Docks Inc., New York City, $226,500; Todd Dry Dock Engineering & Repair Corp., New York City, $235,000; Sun Shipbuilding & Dry Dock Co., Chester, Pa., $237,000; General Engineering & Dry Dock Co., Oakland, Calif., $245,771.

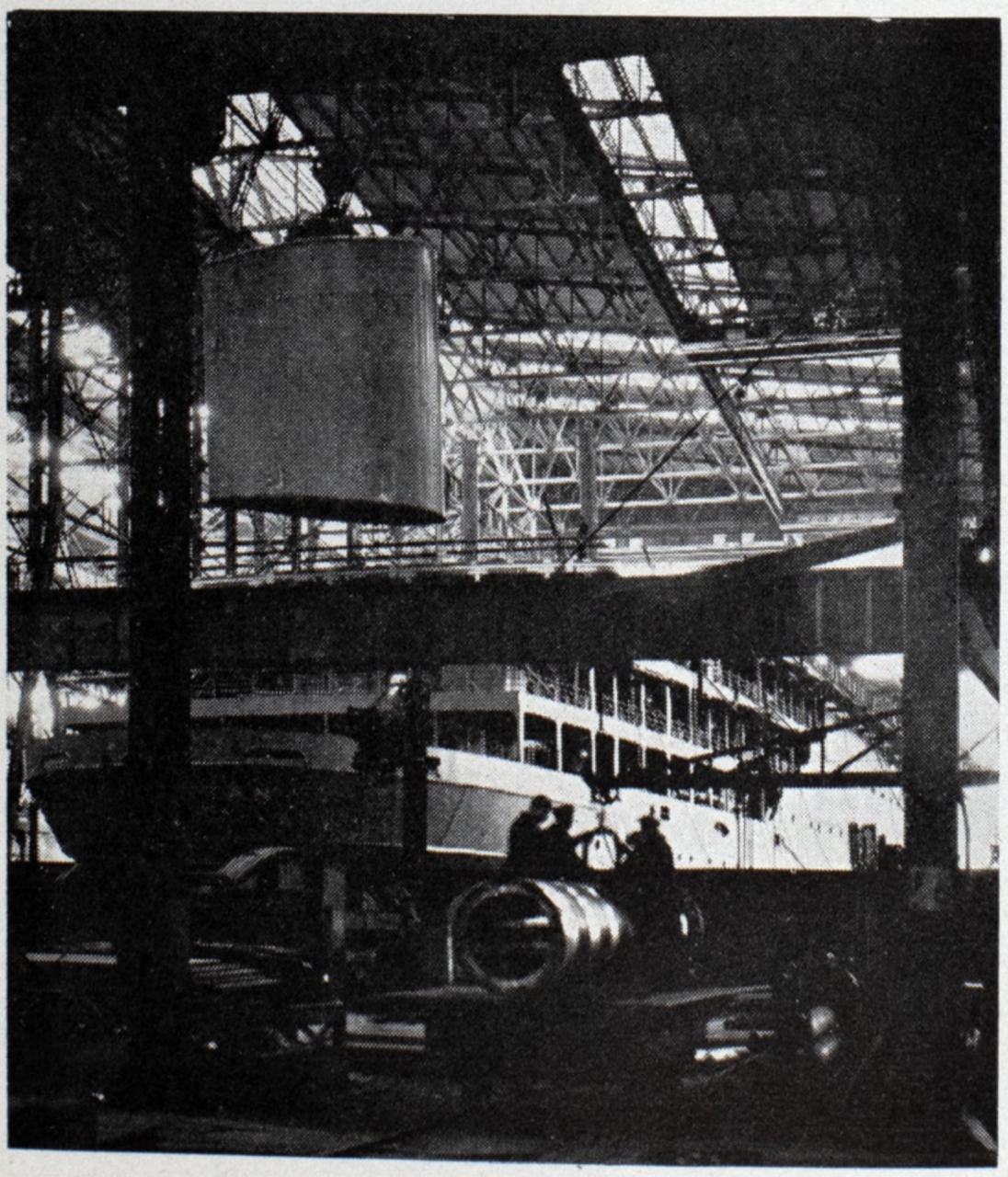
Bids for Lighthouse Tender

Of ten bids submitted for the construction of a new lighthouse tender, the lowest was that of the Bath Iron Works, Bath, Me., according to the lighthouse service, of the department of commerce. This company submitted a bid in the amount of $152,480, the vessel to be completed within 300 days.

The vessel upon which bids were invited is the lighthouse tender HICKORY which is to be built for work in the third lighthouse district. The HICKORY will be a second class or inside tender and will replace the tender PANSY in constructing and maintaining the aids to navigation in Long Island Sound and adjacent waters. The new vessel is to be 131 feet long, built of steel and with steam propulsion, it will have a draft of 8½ feet and a horsepower of about 500.

Vessels of this class are specially equipped for the handling of buoys and other heavy objects, a prominent feature of their deck equipment being the heavy derrick with boom. The HICKORY, of comparatively shallow draft will be suitable for operation in all parts of Long Island Sound and tributary waters.

Other bidders and the amounts of their bids were as follows: New York Shipbuilding Co., Camden, N. J., $175,000; Pusey and Jones Corp., Wilmington, Del., $174,800; United Dry Docks Inc., New York, $190,000; New Jersey Dry Dock & Trans., Co., Elizabethport, N. J., $241,000; Todd Shipbuilding & Dry Dock Co., New York, $205,000; Sun Shipbuilding & Dry Dock Co., Chester, Pa., $219,890; Manitowoc Shipbuilding Co., Manitowoc, Wis., $202,950; Maryland Drydock Co., Baltimore, $177,959; Tampa Shipbuilding Co., Tampa, Fla., $244,894.



Nineteen tons of steel plates were required for one of the funnels fabricated for the United States liner Manhattan, largest commercial liner ever built in America, now at the yard of the New York Shipbuilding Co., Camden, N. J.

Stern Wheel River Steamer

W. C. Nickum, Seattle naval architect, has been commissioned by the department of the interior to prepare plans for a 210-foot stern wheel river steamer for service on the Yukon and Tanana rivers in Alaska. The vessel will have a wooden hull, a beam of 42 feet and will be of unusually light draft. There will be accommodations for about 100 passengers and a freight capacity of 300 tons. Power will be furnished by a tandem compound engine developing about 600 horsepower. Bids will be called in the near future. Materials will be assembled here and shipped to Nenana, Alaska, where the construction work will be finished. Details are in the hands of J. R. Ummel, local representative of the department. It is expected to have the craft ready for service in the spring of 1933. Bids opened for the vessel in December last were rejected, figures ranging from $173,136 to $222,136.

Contract for Reconditioning

The Newport News Shipbuilding & Dry Dock Co. was low on bids submitted to the Mississippi Shipping Co. for reconditioning the vessels CASEY and CLAVARACK. Contract is to be awarded that company subject to the approval of the shipping board.

The bids submitted do not include the total cost of reconditioning and equipping the vessels as the company is buying a large quantity of machinery and other equipment direct from manufacturers and dealers. The total cost of the work is estimated as being in excess of $500,000. The following is a summary of the companies and their bids on the two vessels.

The Newport News Shipbuilding & Dry Dock Co., $173,960 for the CASEY, time 45 days, the CLAVARACK $177,840 and 60 days; the Alabama Dry Dock & Shipbuilding Co., Mobile, Ala., $201,602 for the CASEY, 95 days, the CLAVARACK $206,280 and 115 days; Bethlehem Shipbuilding Corp., Baltimore $237,796 for the CASEY, 95 days, CLAVARACK $247,603 and 95 days; Todd Shipbuilding & Dry Dock Co., Mobile, Ala., $238,000 for the CASEY, 125 days; the New Orleans plant of Todd Shipbuilding & Dry Dock Co., $243,882 and 125 days for the CLAVARACK; Johnson Iron Works, Dry Dock & Shipbuilding Co., New Orleans, $244,540 for the CASEY and 100 days, $248,138 for the CLAVARACK and 120 days; United Dry Docks Inc., New York, $255,596 for the CASEY in 90 days and $260,731 for the CLAVARACK in 90 days.

Last United Fruiter Launched

Miss Patricia Winifred Preston, granddaughter of the late Andrew W. Preston, one of the founders of the United Fruit Co. and its first president, acted as sponsor of the company's new turbo-electric liner VERAGUA, which was launched April 23 from the Fore River yard of the Bethlehem Shipbuilding Co. Ltd.

The VERAGUA, which is the last vessel in the United Fruit Co. program, is of about 11,000 tons displacement, with a length of 450 feet and a beam of 60 feet. The vessel is equipped with General Electric turbine electric propulsion machinery of 10,500 horsepower, which will drive the ship at a normal speed of 18 knots.

Like all other vessels in the United Fruit Co.'s fleet the VERAGUA is painted white and has been especially designed for the trade in which she will be employed. Luxurious accommodations are provided, all in outside staterooms. All accommodations are first class.

The VERAGUA will enter service this summer and will operate between New York, the West Indies and Central American ports.

The United Fruit Co.'s new turbo-electric liner ANTIGUA sailed from New York on April 3 on her maiden voyage for San Francisco via Havana, Costa Rica, the Panama canal and Los Angeles in command of Capt. Wilbert Andrew Card, popular American skipper.

Launched on Dec. 12 last at the Fore River plant of the Bethlehem Shipbuilding Corp., the ANTIGUA is the third of six sisterships to be completed for the United Fruit Co. under terms of the Jones-White act.

Granted Construction Loan

The shipping board April 6 approved the application of the Gulf Pacific Mail Line, Ltd., for loans from the construction loan fund, to be used in the reconditioning and reconstruction of the vessel POINT ANCHA and a sister ship possibly the OSSINING. Both vessels will be used in the service between Seattle and Tampico, Mexico via Puerto Colombia, Colombia and Kingston, Jamica. There will be a separate loan for each vessel not to exceed three-fourths of the cost of reconditioning and reconstruction and not to exceed $150,000 for each vessel. The proposed work, which will be performed in a United States shipyard, will consist of the addition of passenger accommodations for approximately 12 passengers for each vessel and increasing the power of the vessels' propelling machinery and lengthening the vessels by remodeling the sterns. These vessels will be operated under the United States flag and will be employed in an essential trade route from the North Pacific coast ports.

Hydrographic Survey Vessel

The new ship for the Dominion hydrographic survey was launched at the Collingwood, Ont., shipyards on April 14. She has an overall length of 228 feet. Her molded breadth is 36 feet, and depth 23 feet 6 inches. Power is supplied by two triple expansion reciprocating engines, also built by the Collingwood ship yards, giving the ship a speed capacity of 12 knots. The new ship will be used by the department of marine in hydrographic work on the British Columbia coast, and will make the trip by way of the Panama canal.

Saint John Enters Service

Sea trials of the new $3,500,000 liner SAINT JOHN, built by the Newports News Shipbuilding & Dry Dock Co. for the Eastern Steamship Lines, Inc., were successfully held off the Virginia Capes April 14. The liner made an average speed of 21½ knots and developed 12,500 horsepower in her twin screw geared turbine machinery. According to Capt. E. E. O'Donnell, president of the Eastern Steamship lines, who attended the trials, the vessel proved satisfactory in every way.

On arrival in Boston April 25, the SAINT JOHN was given a rousing welcome. She was scheduled to sail on her maiden trip from Boston to Saint John, N. B., on May 2 with a passenger list of 700. After her initial sailing the SAINT JOHN's schedule calls for leaving Boston every Monday and Thursday at 5 p. m. daylight saving time and leaving Saint John every Tuesday and Friday at 7:30 p. m. until June 12, after which there will be three round trips a week.

The SAINT JOHN and her sister ship the ACADIA were designed by Theodore E. Ferris, noted New York naval architect.

Construction is going ahead at the Sun Shipbuilding & Dry Dock Co. on the two vessels building for Sea Train Lines Inc., for the carriage of loaded freight cars. These vessels are single screw 460 feet long.

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
April 18, 1932	4.50@5.00	.70	....
Mar. 18,	4.50@5.00	.65	3.25
Feb. 18	4.50@5.00	.65	3.25
Jan. 18	4.50@5.00	.65	3.25
Dec. 18	4.50@5.00	.65	3.25
Nov. 18	4.50@5.00	.65	3.25
Oct. 18	4.75@5.00	.65	3.25
Sept. 18,	4.75@5.00	.75	3.47½
Aug. 18	4.75@5.00	.75	3.47½
July 18	4.75@5.00	.85	3.72½
June 18	4.85@5.25	.90	3.84½

At Philadelphia

	Coal trim in bunk per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
April 18, 1932	4.50@5.00	.75	3.21
Mar. 18,	4.50@5.00	.65	3.21
Feb. 18	4.50@5.00	.75	3.45
Jan. 18	4.50@5.00	.75	3.45
Dec. 18	4.50@5.00	.75	3.45
Nov. 18	4.50@5.00	.75	3.45
Oct. 18	4.75@5.00	.75	3.45
Sept. 18,	4.75@5.00	.75	3.45
Aug. 18	4.75@5.00	.75	3.45
July 18	4.75@5.00	.85	3.70
June 18	4.85@5.25	.90	3.80

Other Ports

April 18, 1932	
Boston, coal, per ton	$7.80
Boston, oil, f. a. s., per barrel	0.60
Hampton Roads, coal, per ton, f.o.b., piers	$4.25
Cardiff, coal, per ton	13s 3d
London, coal, per ton	—s —d
Antwerp, coal, per ton	18s 9d
Antwerp, Fuel oil, per ton	67s 6d
Antwerp, Diesel oil, per ton	82s 6d
British ports, Fuel oil	67s 6d
British ports, Diesel oil	82s 6d

Builds New, Opposed Piston, Two-Cycle Diesel Engine

By Robert C. Hill

A NEW, opposed piston, two-cycle diesel engine has been developed in Seattle by Adrian C. Estep, designer and patentee of the Washington-Estep four-cycle diesel engine built by the Washington Iron Works since 1921. The first engine of this new type was built by the Estep Engine Co. at the plant of the Gulowsen-Grei Engine Co. in Seattle. It is a three-cylinder engine developing 75 brake horsepower at 400 revolutions per minute. Installed in the tug LEONIE of Seattle, recently completed tests have demonstrated its utility and practicability in actual service. Patents have been applied for on several innovations in the new engine. Plans are under way for the organization of a company to build engines under the new design.

The tug LEONIE in which this first engine has been installed is 44 feet in length by 12 feet 4 inches in beam and 4 feet 4 inches in draft. With a three-bladed propeller, 42 inches in diameter and 36 inches in pitch, this engine is capable of driving the tug at a speed of 9½ knots. It is easily controlled and can be slowed down to 75 revolutions per minute, which is an important feature in small vessels of this type.

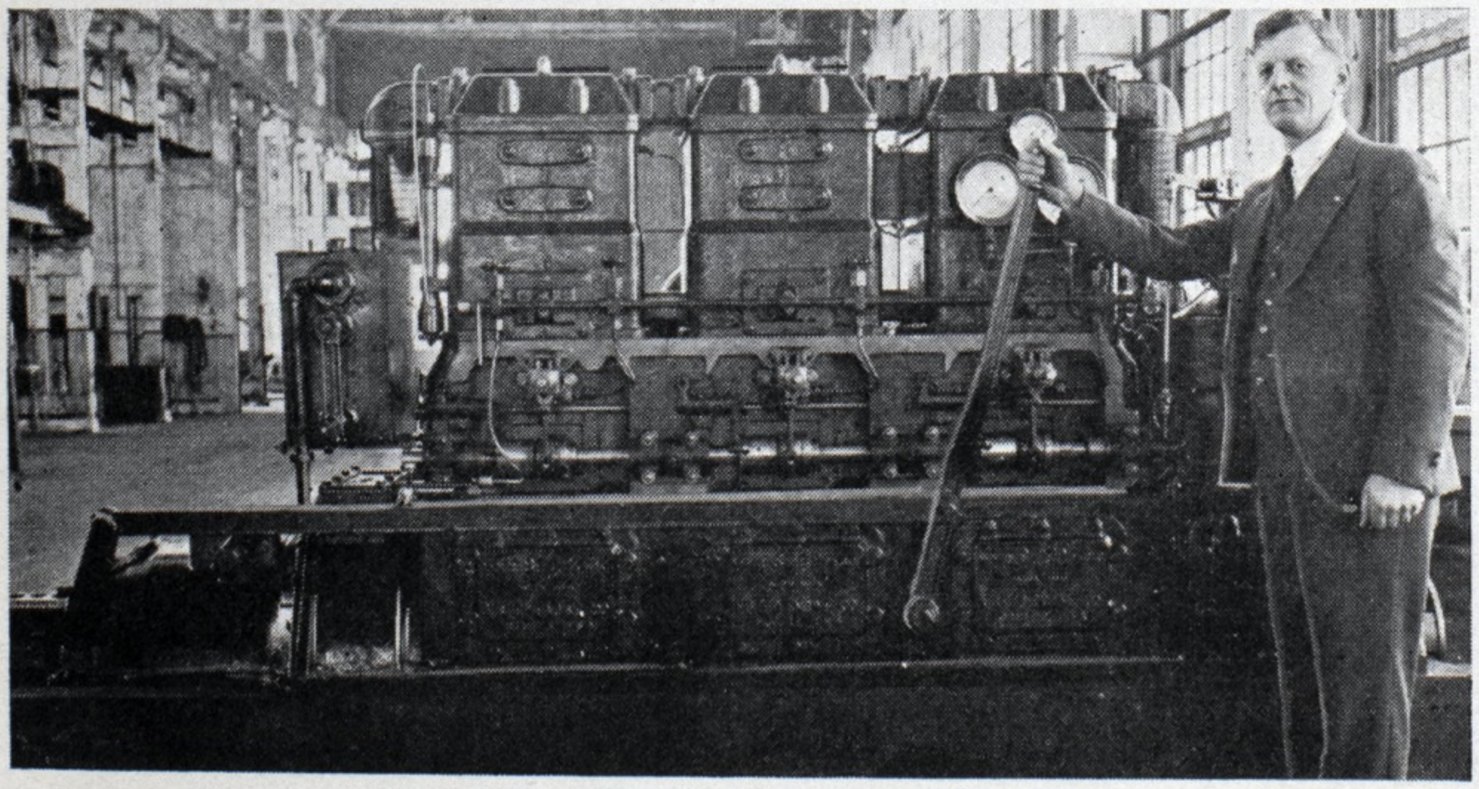
Reduced Weight and Space

In developing this new type of two-cycle engine the objectives have been, to reduce weight and space, to secure a maximum balance, to eliminate complicated valve gears, and to obtain smooth operation. Tests of the first unit, it is said, show that these objectives have been attained and also that the new type can be successfully built in all sizes up to 1500 horsepower.

The characteristics of the new engine in the LEONIE are: Three cylinder marine type: 6 inches bore by 14 inches total stroke (divided 8 inches in the lower and 6 inches in the upper stroke); 75 brake horsepower at 400 revolutions per minute; approximate weight, 9000 pounds. It is a full diesel with 400 pounds compression, giving automatic ignition and cold starting. The opposed piston construction gives a smooth running balanced engine with the torque of an ordinary six-cylinder engine with three cylinders.

The large exhaust and inlet ports at opposite ends of the cylinder controlled by the opposed pistons give high volumetric efficiency and positive uniflow scavenging, equal or better than the four-cycle engine. A large percentage of casting strain caused by unequal expansion from the uneven temperatures of the conventional two-cycle engine is said to be eliminated in this design. Furthermore, the cylinders and frame castings are not subjected to tensile strains and the crankshaft is not subjected to the high conventional bending stress. As a result the parts can be made lighter. In fact the Junkers opposed piston diesel engine for airplanes weighs only 2.59 pounds per horsepower in a 600 horsepower unit at 1600 revolutions per minute.

The scavenging cylinder is on the top with the piston serving as a crosshead guide for the two side rods. The displacement of this upper piston gives 60 per cent excess air for scavenging, thus materially helping to cool and supercharge the main cylinder. A large scavenging air receiver is formed by the enclosure of this cylinder, which space is isolated from the crank chamber, permitting the use of full force feed oiling to all bearings without loss of oil by the transfer of air through same.



New 2 Cycle Opposed Piston Diesel Engine Developed by A. C. Estep, Seattle. Three Cylinder, 75 B.H.P. 400 R.P.M. Installed in 44-foot Tug

Natural Supercharging a Feature

The main cranks are not set at 180 degrees as the center or lower crank is given a 10-degree lead to open the exhaust ports earlier than the inlet ports, yet giving a lap or lag to the closing of the inlet ports, further helping the supercharging of the power cylinders. The scavenging air pump cylinder head contains automatic inlet and discharge valves. The head castings are fashioned to form a continuous central lengthwise passage for the inlet air, with air louvers at each end.

Mechanical or solid injection of fuel is used at about 3800 pounds pressure. The fuel pumps are positively driven at half engine speed and are not required to measure or time the fuel oil. They furnish a surplus of fuel at the required pressure for injection to the manifold with branch stop valves feeding to the mechanically operated fuel spray valves in the side of the power cylinders. Surplus fuel oil passes through a specially designed fuel regulating by-pass valve which holds the pressure constant in accordance with manual adjustment. A sensitive ball bearing gear driven governor controls the engine at all loads and speeds by operating with a wedge system direct on the lift and time of lift of the fuel spray valves. This simple fuel system gives high efficiency, easy starting and reliability on fuel oil with as much as 20 per cent asphaltum.

The engine is fully enclosed and has a neat looking symmetrical appearance. Results of block tests of the engine for over four months are said to have been entirely successful and actual operating results were equally satisfactory. Service tests prove that this engine will develop 75 brake horsepower at 400 revolutions per minute on a fuel consumption of 3.9 gallons per hour of 24 degrees Baume gravity California fuel. This is equal to .393 pounds of fuel per brake horsepower per hour.

The New York Tow Boat Exchange Inc. moved to its new quarters, Rooms 1109-1110, 17 Battery place, New York, on April 15.

The 1932 "List of Lights, Fog-signals and Radio Aids to Navigation" on the inland waters of the Dominion of Canada was recently issued by the Department of Marine, Ottawa. The list is corrected to March 1.

Annual Prizes Offered

The Royal Society of Arts, John street, Adelphi, London, W. C. 2, England, has announced the following Thomas Gray memorial trust prizes for 1932 offered for the improvement and encouragement of navigation:

1—Prize for an invention—A prize of £100 to any person who may bring to their notice a valuable improvement in the science or practice of navigation proposed or invented by himself in the years 1931 and 1932.

In the event of more than one such improvement being approved, the council reserve the right of dividing the amount into two or more prizes at their discretion. Competitors must forward their proofs of claim on or before Dec. 31, 1932, to the secretary of the Society.

2—Prize for an essay—A prize of £100 for an essay on the following subject: "The rescue, by another vessel, of passengers and crew of a sinking vessel, (*a*) when they are still on the vessel and while it is still afloat, (*b*) when they have taken to the boats. Particular attention should be given to improvements which might be affected in life-saving appliances, and to the navigation and maneuvering of the rescuing vessel under varying weather conditions."

Steel Moved at Record Speed

Steel was shipped at a record speed on the Ohio and Mississippi rivers when the steamer A. O. ACKARD of the Carnegie Steel Co. fleet recently completed the run from Pittsburgh to New Orleans, 1939 miles, in 10 days and 20 hours.

The towboat pushed a tow of 5321 tons of steel besides barges of fuel and dropped various tonnages at the three intermediate ports, carrying into New Orleans 1550 tons.

The run to Cincinnati was made in 3 days 13 hours; to Louisville in 4 days 15 hours, and to Memphis in 7 days 20 hours.

Two Steam Driven Oil Burning Coastwise Tugs

IN SHIPBUILDING and ship design, results of experience in service are an invaluable asset in improvement. When the Donaldson Towing & Lighterage Co. decided to have two tugboats built for its service in the vicinity of Baltimore, it was but natural and proper that this company should draw upon its experience in deciding on the characteristics of the new vessels. An order was given to The Pusey and Jones Corp. for building the LOCUST POINT and C. H. SPEDDEN and these vessels were delivered to the owner the latter part of March a year ago.

Both tugs have an over all length of 105 feet; length between perpendiculars, 92 feet; beam molded, 23 feet; depth molded, 15 feet 2 inches; and draft extreme, 12 feet 6 inches. They are constructed of steel with scantlings equal to American Bureau requirements and have steel main deck house and pilot house.

While the two tugs are sister ships there is a slight difference in arrangement, the LOCUST POINT having the galley in the after part of the main deck house with a private room in the forward end and the crew's quarters below on lower deck forward, and the C. H. SPEDDEN having the galley in the forward part of the main deck house with two rooms for the crew in the after end with remainder of crew's quarters on the lower deck forward.

Each vessel is fitted with a steam gypsy on main deck aft with a combined hand windlass and towing bitt forward, also a double towing bitt aft and side mooring bitts. Steering can be changed to either inland or ocean style by means of a clutch located over steering engine in the upper engine room which reverses direction of rotation of controlling shaft to steering engine. The steering engine is of the single ram type operated by steam and is controlled by shafting from the pilot house and top of main deck house aft. The quadrant is connected to steering engine with steel chain and rods. Each tug has an oil bunker capacity of 16,800 gallons giving a cruising radius of 2800 nautical miles at 10 knots.

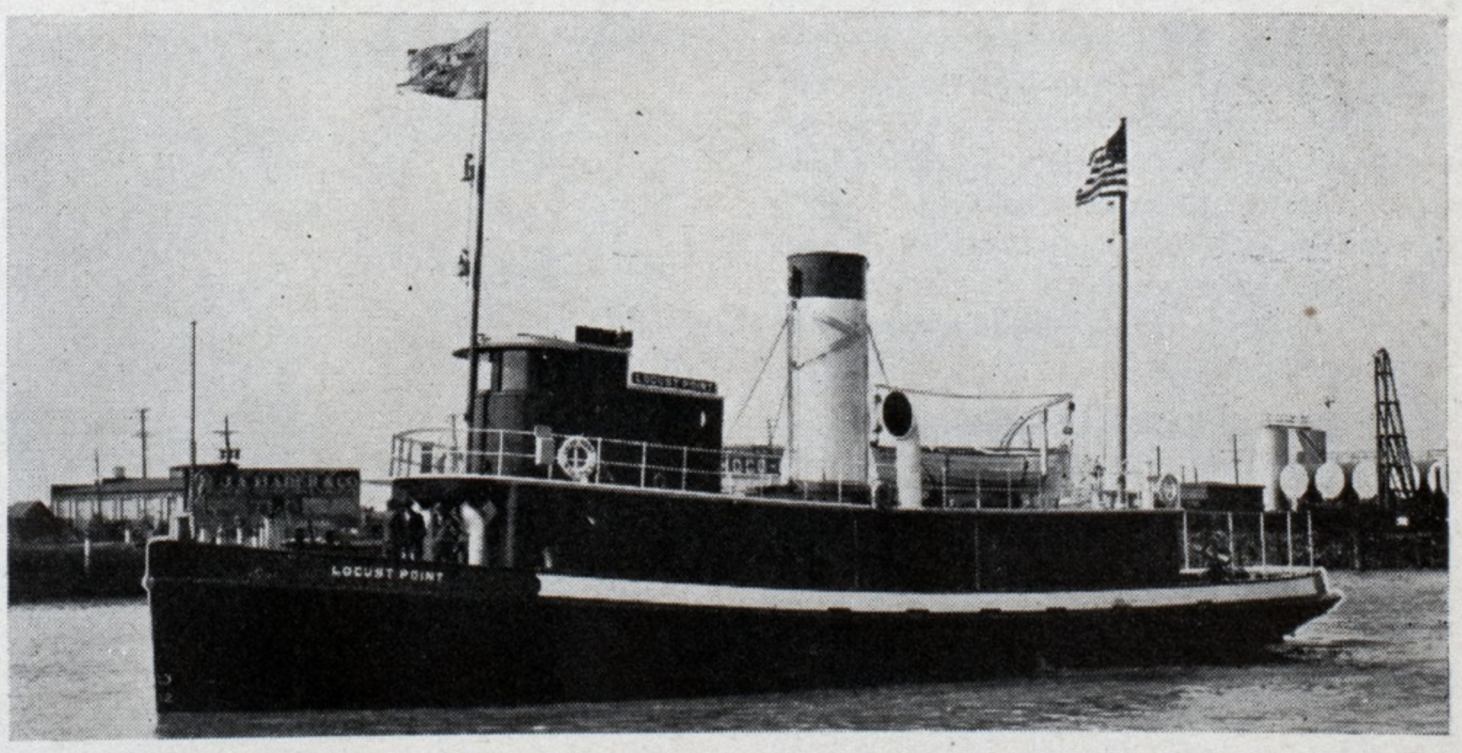
The C. H. SPEDDEN is driven by a triple expansion condensing steam engine, 15½ x 26 x 44 inches and 26-inch stroke, rated at 700 indicated horsepower, with an independent two-pass condenser of 1510 square feet cooling surface. Cooling water is supplied by a steam-driven 8-inch suction circulating water pump. The LOCUST POINT is driven by a compound condensing steam engine 16½ x 34 inches and 25-inch stroke, rated at 600 indicated horsepower, with attached condenser forming part of engine having 900 square feet of cooling surface. The air, bilge and feed pumps are attached to and driven from the main engine.

The main engines in each case are operated from the upper working platform which is level with the main deck. Steam is supplied by a single ended Scotch boiler at 185 pounds pressure. The boiler is 13 feet 3 inches in diameter and 11 feet 6 inches long and has three Morrison corrugated furnaces, 45 inches in diameter. The total heating surface is 2080 square feet. The oil burning equipment consists of Todd mechanical fuel oil-burning equipment complete with assisted draft type air registers and mechanical pressure atomizing burners. Air is supplied by one Sturtevant turbo-blower.

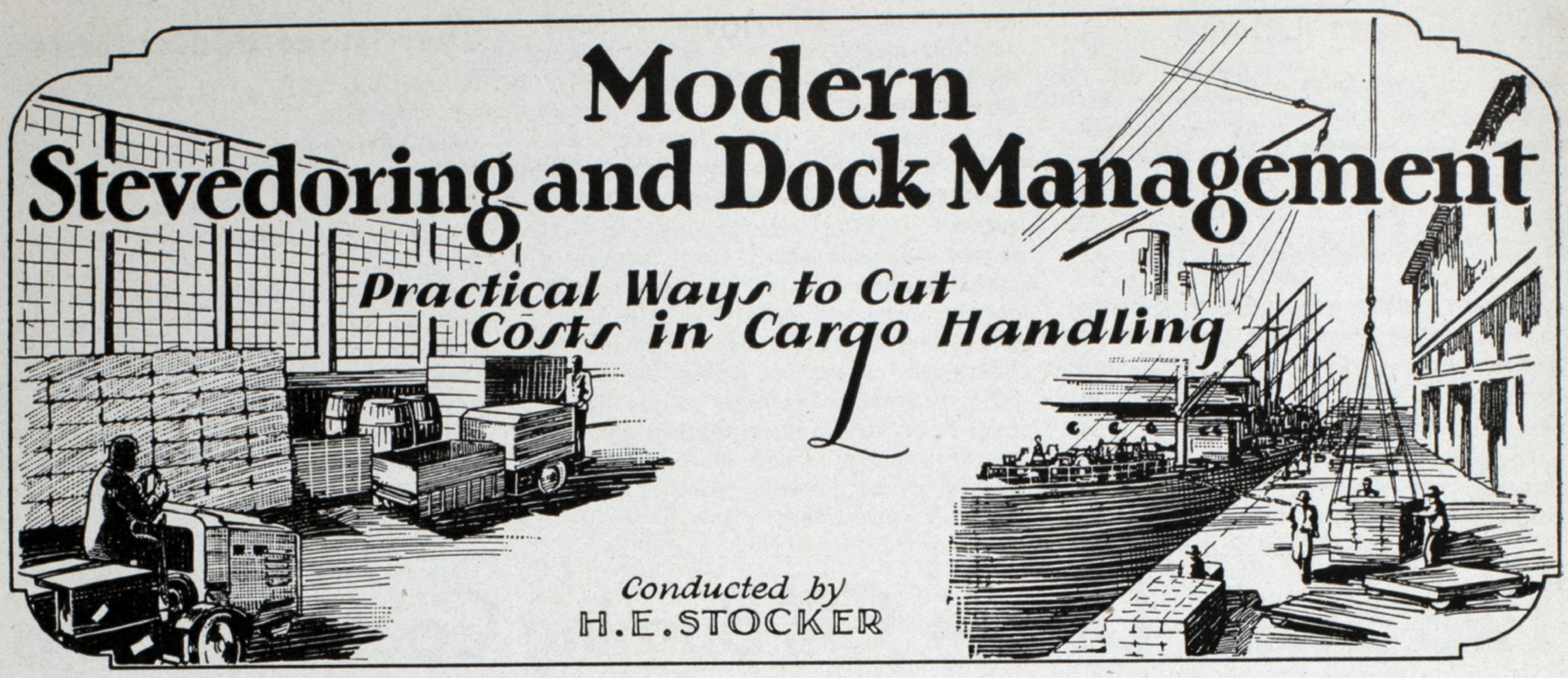
The propeller wheels for both tugs are three-bladed cast steel solid type, the dimensions for the SPEDDEN being 8 feet 4 inches diameter and 11 feet pitch, while for the LOCUST POINT the diameter is 8 feet and the pitch 10 feet 9 inches. Thrust bearings are of the horseshoe collar type running in a bath of oil.

Principal auxiliaries in the engine room are, one general service and fire pump, horizontal duplex, 7½ x 5 x 6 inches; one fresh water pump, horizontal duplex, 4½ x 3¾ x 4 inches; and salt water pump, horizontal duplex, 4½ x 3¾ x 4 inches; all three Worthington. One No. 10 Koerting injector; and one 2½-kilowatt Westinghouse turbo-generation.

The fore and aft peak tanks are piped to carry fresh water for boiler feed. Fresh water for drinking purposes is supplied from a 720-gallon tank after end of engine room.



Steam Tug Locust Point Built by Pusey & Jones Corp. for Donaldson Towing & Lighterage Co. Sister Tug C. H. Spedden



Personnel Management is Chief Factor in Improving Cargo Handling

By H. E. Stocker

THE essence of effective organization is contained in the principles followed to achieve full co-operation from the personnel of an organization. The burden of gaining the full co-operation of the personnel rests solely upon management. If the management is efficient, poor material can often be so well organized as to obtain excellent results. On the other hand poor leadership or inefficient management, will produce poor or mediocre results, although the men and women constituting the personnel, may be of a high type of intelligence.

Good management follows closely the basic principles of organization management, which principles are based upon the principles of modern psychology. We had great leaders before we became acquainted with modern psychology. These leaders grasped the fundamental truths of the management of men long before psychology as a science, was recognized. Some of the fundamental principles of organization management are discussed in this article, others will be discussed in future articles.

Right Kind of Records

Definite and clear cut responsibilities should be assigned to each executive and with these responsibilities should be coupled to corresponding authority. Authority should be delegated, but only with adequate controls.

Adequate records are necessary to proper organization control. In any but the very small organization, effective control cannot be exercised without the aid of such records.

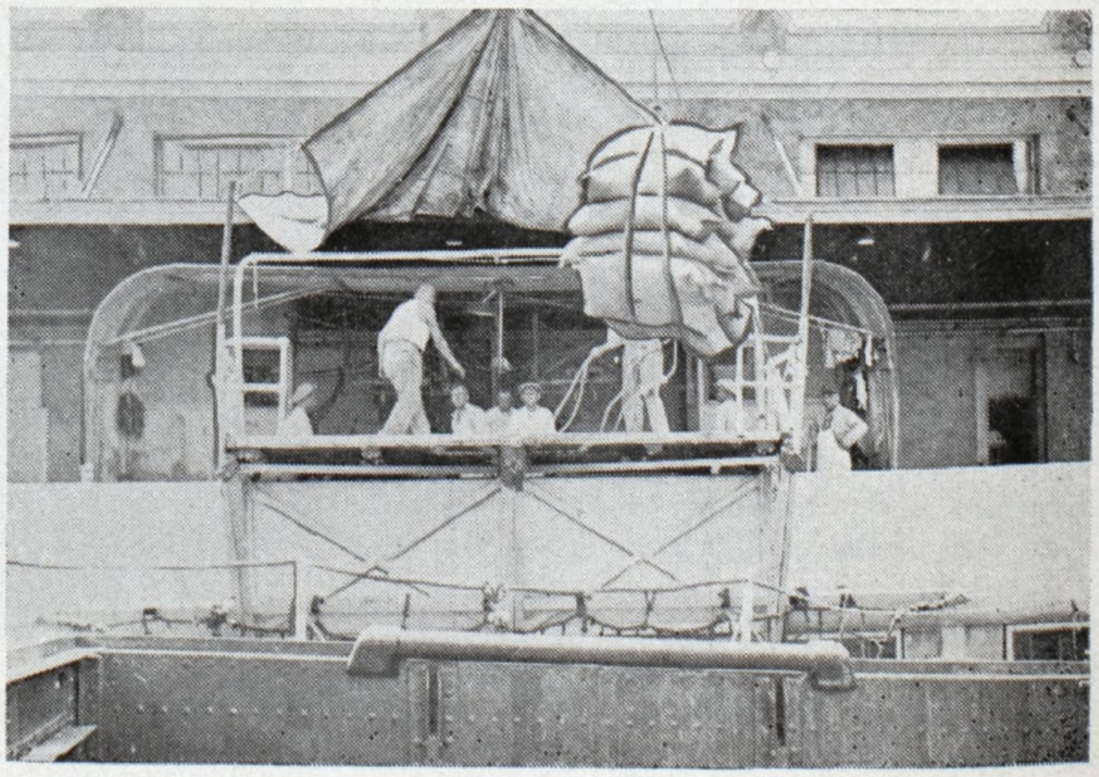
Also decisions are based on the information in an executive's mind at the time a decision is made. Inadequate records either fail to supply all of the information necessary for accurate decisions or may supply inaccurate information. A thorough analysis of costs, tonnage, performance and other information, discloses opportunities for economy and improvement that would often be overlooked. Curves plotted on cross section paper, by showing this information graphically, are of great value. The most economical operation I have knowledge of, makes use of this "tool" of management.

Spot checking, climbing down the ladder to the lower hold to check handling and stowage of cargo often discloses conditions that would otherwise not be known. Also much is learned by arriving on the pier in the early morning when one is not expected. Information disclosed in instances of this sort often lead to important improvements.

The men responsible for cargo handling operations should have their offices on the pier to facilitate checking operations at point of operation. There is far greater opportunity for knowing conditions on the terminal and on the ships when the terminal and ships can be inspected frequently and without waste of time traveling to and from the terminal.

The engineering method applied to the problem of cargo handling is advantageous because that method brings

By following sound practical organization principles this cargo handling operation has been made one of the most economical



to the job, the most effective analysis. *Thorough* analysis is the essence of the engineering method as contrasted with the partial analysis made by the man who is not a trained engineer. The best modern executives have engineering assistants in their organizations and adequate attention is given to the analysis made by these men.

Arranging an Attractive Incentive

A wage incentive or bonus plan is an important aid in enlisting the maximum co-operation of an organization. A wage incentive or bonus plan appeals directly to the personal interests of the personnel. Creating and maintaining the desired interest of a personnel is probably the most difficult problem the management of an organization has to face.

Wage incentive or bonus plans, properly designed and executed, develop the maximum co-operation of em ployes, a degree of co-operation otherwise attainable only by the highest quality of leadership. Compared to other plans such as a stockholding plan for employes, the bonus plans reward employes more in proportion to their direct value to the company.

Wage incentive or bonus plans can be applied to operations as complex as handling cargo. This will be demonstrated in a forthcoming article in the MARINE REVIEW.

However, no one person is a consistent whole, thinking only of the money value of his job. "Neither managers nor men can be adequately understood if thought of as wholly controlled by economic or any other single set of motives.

"Each man exhibits some contradictory traits or diverse dispositions in almost watertight compartments, or in frequent conflict. Each man has something of nearly every sort of disposition in him. He is timid and bold, wise and foolish, a Buccaneer and a good Samaritan. The proportions vary so widely as to make an infinite variety of combinations, and there are few men, if any, who can be adequately described by one simple label. In readiness of understanding, in sensitiveness of self respect, in natural energy and in strength of economic nature and in speed of response to any stimulus, individual men cover wide ranges."

Security of Employment

Valuable as wage incentive plans are in attaining maximum results, the most powerful incentive of all is the fear of losing a good job. Security is the greatest asset that a company can offer.

The fear incentive must not take a stultifying form for this decreases a man's efficiency because of worry. The fear incentive should only bring a realization of the value of the job and a desire to do everything to hold it. The majority of men are not confident of their ability to get a job if they lose one—also there is the stigma of being "fired," however unfair that stigma may be.

An important principle of organization states:

A man should not be criticised in the presence of an assistant or another of lower rating. "Raw hiding" is not a good practice. It is excusable only when an employe's attitude is antagonistic. Such a practice is humiliating and impels men of spirit to fight back whether the criticism is right or wrong. Although a man may be justly criticised, if he is criticised in this manner, he is being criticised in an *unjust* manner, and is justified in defending himself.

Threats Should Not Be Used

Threats are stultifying and reflect throughout the entire organization. Great harm is done in the results obtained. Those in the organization are obsessed with fear of loss of work.

Weak supervision is harmful. Supervision should be firm. Waste should be firmly controlled—whether waste of time, energy or material.

When a man fails to produce satisfactorily, rather than threaten him with the loss of his job, he should be *trained* to produce satisfactorily. If he fails to respond to such training, he should be cut loose from the organization quickly. Not be kept working with a threat hanging over him. The method of training the personnel is better for both the organization and the personnel.

The Cunard Steamship Co., 25 Broadway, New York, is distributing its 1932 edition of "Foreign Government Representatives in New York City". This little booklet contains the names and addresses of consuls located in New York, together with telephone numbers and office hours, and will be sent to anyone upon application to C. W. Kenick, general freight manager, with the compliments of the Cunard line.

Issue Port Supplement

The annual revision of the volume "Port and Terminal Charges at United States Ports", published by the bureau of operations of the United States shipping board in cooperation with the board of engineers for rivers and harbors of the war department, Washington, D. C., this year takes the form of a supplement which brings the information contained in the 1931 edition up to date as of Jan. 1, 1932.

This supplement, together with the volume to which it pertains, contains authentic information regarding port dues and charges at the principal ports in the United States and its possessions.

Only Moderate Decline in Traffic at Texas Ports

STATISTICS covering export trade of Texas ports in 1931 showed a decrease of only 7.90 per cent over the previous year. In total tonnage handled, Houston with 13,971,755 again led all Texas ports for the year. Beaumont rated second with 11,758,002 tons and Port Arthur third with 9,390,312 tons.

Other Texas ports ranked as follows: Galveston 3,390,085; Texas City, 3,370,014; Port Arthur 1,739,768; Freeport 511,040; Corpus Christi 462,654; Sabine Pass 609,312 and Orange 18,328.

Houston also showed a substantial lead over its other state competitors in exports, the total movement being 4,056,289 tons with a valuation of $169,916,414. Under this classification Port Arthur ranks second with 1,582,336 tons valued at $120,685,814 and Galveston third with 1,386,920 tons valued at $100,131,790.

In imports the rank of Texas ports was as follows: Houston 293,670 tons; Galveston 228,386 tons; Beaumont 100,360 tons; Texas City 72,754 tons; Orange 9886 tons; Port Arthur 6972 tons and Corpus Christi 4719 tons.

Showing Cargo Operations By Moving Pictures

IN ITS educational service to demonstrate to shippers and steamship operators the practicability of using the fibreboard case in ocean shipments, the Export Fibreboard Case association has adopted the use of moving pictures. This method of demonstrating the fitness of this type of case is being used in the United Kingdom and Continental Europe.

About 2000 feet of film has been made showing the methods and practices of handling fibreboard cases in the cannery, packing house, warehouse, and along the water front at various seaports of the United States. These pictures are being shown abroad to buyers, warehousemen, longshoremen, and overland carriers, both rail and motor. By means of portable projectors these pictures can be shown wherever there is ordinary electric power available right on the desks in offices of those interested in shipments and will supplement interviews on behalf of exporters.

In this way will be illustrated by action pictures all regular operations and the details of handling which have been found most practical and economical. None of the scenes in the pictures were posed or rehearsed; they were all taken from actual operations which may be seen almost any day and almost anywhere in the export trade in seaports of the United States.

Good Lighting on Shipboard Increases Efficiency

THE importance of adequate lighting on terminals was discussed in the September, 1930, issue of MARINE REVIEW. The importance of adequate lighting of cargo handling operations aboard ship is discussed in this article.

Adequate lighting is obtained when there is plenty of light and no glare. Quantity is not the only measure of good lighting, quality with freedom from glare and annoying shadows is an equally important factor to be considered. Lamps must not be placed where the glare of the direct light blinds the longshoreman. This condition arises when men pass from the terminal through the side port into the deck. Under these conditions a minimum intensity of lighting of three foot-candles is found to be the most satisfactory and the fixtures should be placed so as to avoid shadows.

Ship's Lighting Requirements Vary

The lighting requirements vary under various conditions and are measured in foot-candles. Foot-candles is the term used to denote intensity of illumination. One foot-candle is the intensity of illumination equal to one candle power produced on a surface placed one foot distant and at right angles to the source of light.

Intensity of illumination should vary for various parts of the ship to avoid waste of light and at the same time to illuminate the surroundings adequately for safe and effective work by longshoremen. For holds and decks the minimum intensity should be two foot-candles; for gear aloft, one half foot-candle. The Kane portable cargo light described in the August issue of the MARINE REVIEW has proved very satisfactory for hold and 'tweendeck lighting.

Permanent lights are desirable on king posts and masts. The type found usually on shipboard is satisfactory with the exception of the lamps used. These should be of 300 to 500 watts capacity.

All block, shackles and other gear aloft should be well illuminated particularly gear at the end of booms so that it is clearly visible to those on deck.

The clusters commonly used on shipboard are fitted with low power bulbs and ineffective reflectors. The illumination intensity of the usual cluster in working places does not exceed one quarter of a foot-candle which is utterly inadequate for safe and effective working.

It is a waste of money to provide good lamps and reflectors and overlook the light absorbing qualities of different colored painted surfaces and also dirt accumulation on such surfaces and on lamps and reflectors. Whenever light strikes a surface, part of it is absorbed and part of it is reflected. The proportion absorbed and reflected depends upon the paint used on the surface. White paint absorbs only 20 per cent of the light while dark brown paint absorbs 85 per cent.

A test by the United States bureau of public health disclosed the improved efficiency of lighting in a letter separating operation after the walls were freshly painted.

A 150-watt lamp and properly painted walls, provide 7.2 foot-candles as compared with 7.7 for a 200-watt lamp and dirty walls. Accumulations of dirt will reduce the illumination from one-third to one-fifth of the illumination obtained when surfaces are freshly painted.

The light absorbed is money wasted. Tests show that this waste will often make it economical to repaint surfaces earlier than would be considered necessary for the sake of appearances alone. The proper time for repainting depends on the cost of the current as compared with the cost of the paint and labor for painting. Modern management has proved it worthwhile to measure such items.

Shipboard conditions preclude the use of white paint with its high reflecting qualities for holds and 'tween decks. A cream colored paint has been recommended by shipping men who have studied the problem, as a fair compromise between the usual red that absorbs a high percentage of light and white that absorbs little.

Lighting losses and the losses that result from poor lighting should also be stopped by keeping the lamps and reflectors clean of dust and other dirt. As much as 50 per cent of the light can be absorbed by the collection of dirt and dust on lighting equipment. Where oil and grease are present, mere wiping of equipment is not sufficient, the reflectors should be cleaned with a material that will completely remove the accumulated oil and grease.

When lights are exposed to explosive gases that may escape from cargo, it is vital that vapor proof fixtures be used. Nearly all fine dusts will explode when in contact with a spark, flames or incandescent objects if the right proportion of air is present.

Vapor proof fixtures have a clear glass enclosing globe around the lamp. All joints are sealed tightly so there is no opportunity for the explosive vapors or dusts to ignite.

Adequate wiring is essential to adequate and economical lighting. Where wiring is inadequate the feeder and circuit capacities are usually too small to permit the use of lamps of a size that will provide the amount of illumination needed. The use of small wires or long runs of wires causes a leakage of the voltage so that there is a heavy loss between the meter and the lamp. The loss of a few volts seriously affects the illumination output of the lamp. For this reason the development of modern illuminating engineering should be carefully considered when designing or reconditioning a ship.

All lighting equipment on shipboard must be of such construction that it will stand up under sea conditions and will be suited to conditions that exist when a ship is handling cargo at a port. Possible damage to lamps from handling and stowage of cargo and rough handling of portable lights, theft of globes, danger from fires, are some of the conditions that must be considered in planning the lighting equipment for a ship.

Adequate lighting has the economic advantage of providing safe operation, reducing accidents to personnel and reducing damage to property.

While figures are not available as to the direct money savings due to providing adequate lighting on shipboard, the figures that are available of results accomplished in many kinds of shore operations are convincing proof that adequate lighting whether ashore or on shipboard is sound business practice.

General Electric Awarded Contracts at Panama

Engineers of the General Electric Co. which equipped the locks of the Panama canal nearly 20 years ago, will participate in the new Panama construction exploit, the building of a $4,000,000 dam across the Chagres river. Electric motors of 100 horsepower are to move two tall cableway towers on each bank of the river, and a motor of 400 horsepower will propel a 20-ton bucket for excavating and concrete work. More than 22,000,000,000 cubic feet will be enclosed by the reservoir which will be formed by the dam.

This reservoir will control the volume of water supplied to the canal locks by the river, and will make it possible to pass a larger number of vessels through the locks. The dam will also be the site of a hydroelectric power plant to contain two General Electric 10,000-kilowatt generators. Transmission lines at 44,000 volts will connect this plant to the electrical system of the canal and the Gatun power station, which General Electric equipped originally.

Useful Hints on Cargo Handling

THE comparatively new science of office management has attained such worthwhile results in so many different kinds of offices that it is worth greater consideration in shipping offices. Savings of 15 to 25 per cent and more are possible by the application of scientific methods to office management.

A well managed office is an important factor in reducing freight handling costs and keeping it at a low figure as well as providing better service. The same is true in other departments. The application of the fundamental principles of office management has resulted in these reductions in costs and other advantages.

Modern management has proved that the one best way requires attention to environment or the conditions under which the work is performed. We know that the best results cannot be obtained in poorly lighted, poorly ventilated and poorly heated offices. We also know that these conditions can be put on a satisfactory basis at small cost, consideration being given to the results obtained when work is performed under the best conditions.

Some shipping offices violate all these requirements. The walls are dingy and absorb light rather than reflect it. This reduction in reflection amounts to one third to one fifth of a newly painted surface. The lights are many times inadequate with respect to globes used, reflectors and position.

Ventilation and heating is inadequate, desks and chairs are poorly designed and toilet facilities are not as they should be. Such conditions are tolerated because it is thought to be economical not to spend money on these improvements, but money saved this way is wasted in ways not so easily determined, but never the less just as potent—higher lighting bills, disruption of work because of the illness of employes, time wasted in walking excess distances for drinking water—and so on.

Saving Checkers Time

TO AVOID waste of checkers time on a large terminal, some method must be developed to handle the papers between the receiving office and the checker. One line instructs the checkers to turn the papers over to the driver who turns them in to the office. Worked in conjunction with the pass system, this method works satisfactorily.

One steamship line has a "line man" who works between the receiving office and the checkers, bringing papers and returning them as required. Each checker has a desk on wheels in which he keeps his copies.

THIS page is being devoted to short items on all matters having to do with the more efficient turnaround of ships. These items are intended to be of a helpful nature.

We will welcome for this page brief descriptions, illustrated if possible, of any better or safer way of performing any function in cargo handling. Also, any questions submitted will be answered by the editor.

Although accountants must be accurate, statistical records need not be carried out to the same degree of accuracy. Much valuable time is wasted in some organizations by carrying calculations out to several decimals and doing other statistical work that does not increase the value of the records with respect to the purpose for which it is compiled.

Greater Output Per Man

ONE stevedore discharged cotton at the rate of 125 bales an hour to lighters with twenty men. Another stevedore loaded 150 bales an hour with thirteen men. Comparative analysis of these two operations showed that the first stevedore was wasting 27 cents a ton because of the use of an excessive number of men and because he was getting too low a rate of discharge.

The stevedore with the high record in bales handled per hour used a bale hook instead of a rope sling. Two bales were hoisted at a time as compared with two to three bales handled with the rope sling, but less time was needed to attach the hooks so that the number of slingholds an hour was greater.

Portable Gasoline Cranes at Los Angeles

Typing of information on forms can be expediated by arranging the forms in such a manner that the number of shifts from line to line is reduced.

Budgeting Terminal Costs

A WEEKLY budget has proved advantageous in controlling terminal costs other than stevedoring. A budget is made up at the beginning of the week, showing number of checkers and other employes for each day of the week. The number of employes is based upon the estimated tonnage for the week. If conditions on any day require additional men, these are shown as extras and adjustment on total payroll expense is made to take care of this fluctuation.

When the week is completed Saturday night, the exact cost per ton is known. During the week, the management knows to within a small percentage of error, what to expect at the end of the week.

Wire cable in reels should be stowed on edge and usually stowed fore and aft. In the ships that roll but little, thwartship stowage is preferred.

Onions and rice have been stowed together without damage to the rice.

Instructions Made Plain

A MANUAL containing all instruction relating to the management of a pier has proved an effective means of avoiding loss of organization time and friction due to verbal instructions, which are often forgotten or misunderstood. The idea of a written manuel resulted from the necessity of having to repeat instructions several times before the instructions were followed with any consistency.

Putting all standard instructions in writing and not accepting excuses for not following instructions reduces the time necessary to train a new organization personnel and "jack up" an old one, and accomplishes lower costs, and less damage in a minimum time.

Up and Down the Great Lakes

Lakes-to-Gulf Waterway—Lake Lines Sold to Eastern Interests—Lake Levels—Contract for Dredge and Tug—Vessel Names Changed

FINAL contracts are being let on the federal division of the Illinois river link of the Lakes-to-Gulf waterway. Arundel Corp., Baltimore, has been awarded the contract for dredging of the Dresden island pool of the Illinois waterway, according to announcement of the United States engineer's office at Chicago. Bids also have been received for the construction of retaining walls along the east side of the river at Joliet, Ill., which will cost about $300,000.

The contract for the building of a dam in the river at Marseilles, Ill., has been let to Stevens Bros. and the Miller-Hutchinson Co., New Orleans, at $497,175, work to be completed in 240 days. Installation of operating machinery for Chicago sanitary district bridges between Lockport, Ill., and Chicago, and establishment of a joint waterway and rail terminal in Chicago are the remaining obstacles facing state and federal officials. Provision for the terminal at Chicago is embodied in a bill now before a special session of the Illinois legislature. Shipments already have moved on the stretch of channel of the Lakes-to-Gulf waterway to Peoria, Ill. from the Gulf, including a barge shipment from Mexico.

The Starved Rock pool, a unit of the Lakes-to-Gulf waterway at Ottawa, Ill., about 70 miles north of Peoria, was flooded April 1, opening a navigable waterway between Ottawa and the Gulf of Mexico. Federal Judge Charles E. Woodward, of Chicago, had issued an order giving the government possession of some 240 acres of land in LaSalle county along the Illinois river for flooding in the operation of the Starved Rock dam and pool.

Sold to Eastern Interests

According to announcement April 12, the Nicholson Universal Steamship Co., the Newtex Steamship Corp., the Spokane Steamship Co. and the Universal Terminal Co. of Ohio have been sold to eastern shipping interests headed by Fred L. Hewett, New York and Boston banker.

The Nicholson Universal Steamship Co. operates in conjunction with the Spokane Steamship Co. in and out of all major lake ports between Buffalo and Milwaukee. The Newtex Steamship Corp. conducts a weekly express service between New York and Houston, Tex. The group which made the purchase, is planning a large organization of shipping lines serving the Atlantic Coast and the Great Lakes. Operation will be through the United States Freight Co., a carloading and freight-forwarding corporation.

March Lake Levels

The United States Lake survey reports the monthly mean stages of the Great Lakes for the month of March as follows:

Lakes	Feet above mean sea level
Superior	602.02
Michigan-Huron	578.21
St. Clair	573.21
Erie	571.68
Ontario	245.26

Lake Superior was 0.15 foot lower than in February and 0.35 foot higher than the March stage of a year ago.

Lakes Michigan-Huron were 0.01 foot lower than in February and 0.90 foot lower than the March stage of a year ago.

Lake Erie was 0.18 foot higher than in February and 0.89 foot higher than the March stage of a year ago.

Lake Ontario was 0.21 foot higher than in February and 0.59 foot higher than the March stage of a year ago.

Dredging of Saugatuck Harbor, Mich., has been authorized by Maj. Gen. Lytle Brown, chief of army engineers at Washington. The dredging has been authorized with a view to restoring the harbor channel to project dimensions.

Contracts for Dredge and Tug

Contracts for a steel dredge hull and a steel tug were recently closed by the Great Lakes Engineering Works. The work will be done at the River Rouge yard and will provide employment for a considerable number of men for about three months.

The dredge job is for the Dunbar & Sullivan Dredging Co. It will be 125 feet long with a 42-foot beam and 10-foot depth, fitted with a steel house the full length of the hull and small house for captain and inspector. Total weight of steel required will be about 400 tons. Hoisting and dredging machinery will be removed from a wooden hull and installed in the new hull.

The steel tug, 85 feet in length, 21 feet beam and 13 feet molded depth, with steel deckhouse, is being built for the Ford Motor Co. Power for propelling the craft will be supplied by a 500-horsepower diesel engine driving two generators direct connected.

Vessel Names Changed

Six lake vessels will bear new names during this season of navigation on the lakes. The AMBERG will be changed to HEEKIN; the G. N. WILSON to CONSUMERS POWER; the CLEMENT to U. S. GYPSUM; the L. R. DAVIDSON to DIAMOND ALKALI; the WICKWIRE JR. to THUNDER BAY QUARRIES; and the W. T. ROBERTS to DOW CHEMICAL. The vessels DIAMOND ALKALI, THUNDER BAY QUARRIES and DOW CHEMICAL, managed by Boland & Cornelius, Buffalo, were converted during the winter at the Lorain yard of the American Ship Building Co. into modern self unloaders. The conversion of these vessels was described in detail in the April issue of MARINE REVIEW.

Great Lakes Radio Service

Over-ruling the exceptions filed by the Midwest Wireless Co. charging the Radiomarine Corp. was trying to create a monopoly for Great Lakes radio service, the Federal Radio commission handed down a decision stating that the Radiomarine Corp. will provide radio service for Great Lakes shipping interests in the future.

Sustaining Examiner Elmer W. Pratt, the commission granted the applications of the Radiomarine Corp. for installation of additional point-to-point communication facilities in the Great Lakes area and denied the application of the Midwest Wireless Co. which asked to erect new stations for this service.

The decision authorizes the Radiomarine Corp. to operate stations WCY, Cleveland; WGO, Chicago; WRL, Duluth; and WBL, Buffalo in point-to-point communication service with station WLC, Rogers City, Mich.

Equipment Used Afloat and Ashore

X-Ray Machine—All-Weather Sextant—Condenser Tubes—Sonic Locator—Liquid Rubber—Safety Coupling—Oil Purifying Plant—Chain Pipe Vise—Cleaning Tool

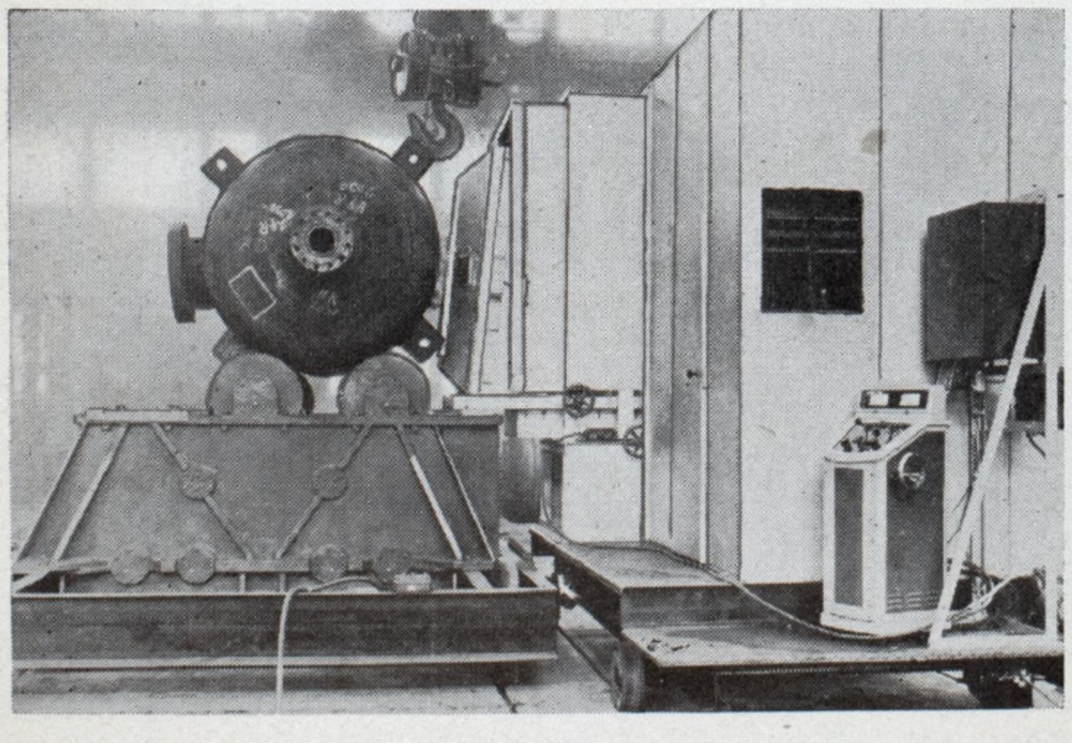
THE installation of the first X-ray machine in a shipyard for commercial use is claimed by the St. John X-Ray Service Corp., 505 Fifth avenue, New York. This installation, recently built at the yard of the Sun Shipbuilding & Dry Dock Co., Chester, Pa., while designed primarily for routine examination of welded seams in pressure vessels according to the requirements of the A. S. M. E. boiler code, can be used with equal facility for the inspection of castings and other objects. Flexibility and convenience have been secured by a coordinated system of supporting and rotating the vessels to be examined and of supporting and shifting the X-ray tube.

The proper auxiliary lead shields between the X-ray and the outer surface of the vessel to be examined are attached to the box itself and adjust themselves to the contour of the surface as the tube is moved into position. Similarly auxiliary shields attached to the film carried adjust themselves to the contour of the inner surface when the carrier is placed in position. This film carrier is moved along an adjustable rail for longitudinal seams or held by adjustable stops for girth seams, and is removed only when passing from one seam to another. The films themselves are contained in inexpensive folders weighing but a few ounces each instead of in the usual bulky and heavy cassettes.

The transformers for producing the high-voltage current to excite the X-ray tube and all the high-voltage connections are enclosed within a metal housing on the X-ray car, and with the car itself are thoroughly grounded through the rails. Adequate safety devices prevent entry to the high-voltage enclosure while the current is on.

The dark-room is provided with constant temperature bath, tanks and dryer for developing films rapidly and economically.

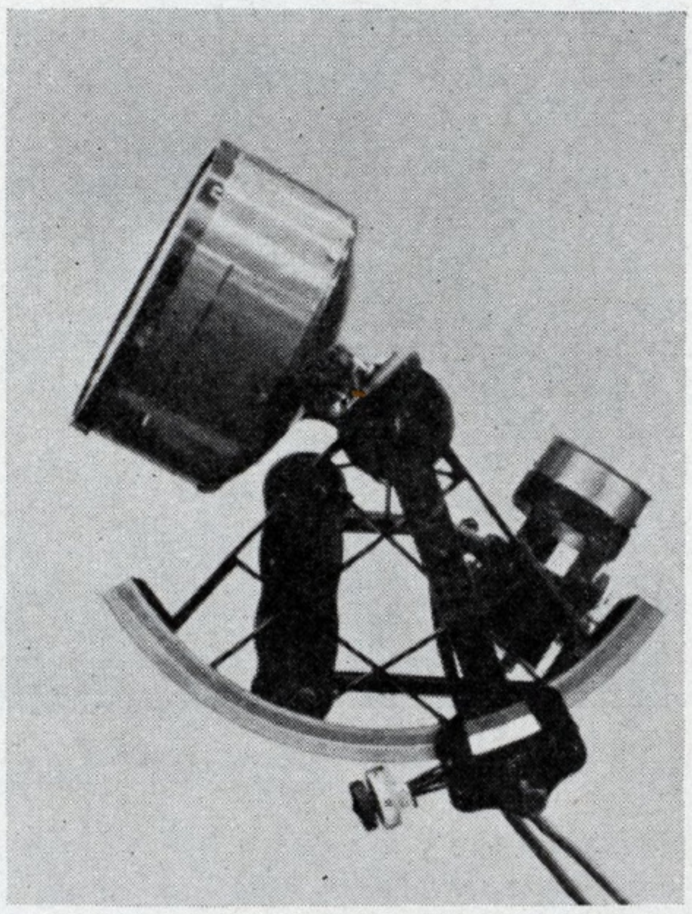
For the examination of castings and miscellaneous articles a special lead-covered booth is provided near one end of the track for the X-ray car. The entire installation is under a crane-way and adjacent to a railway track.



St. John X-Ray equipment at yard of Sun Shipbuilding & Dry Dock Co., showing method of supporting and handling material to be examined and system of shifting and supporting the X-Ray tube

All-Weather Sextant Is Aid to Navigation

AN ALL-WEATHER sextant with which accurate observations may be taken at any time during the solar day when either or both the sun and the natural horizon are obscured by fog, clouds or other weather conditions, as well as when the sun is visible, is being produced by the Macneil Instrument Co., 25 Broad street, New York.



Macneil All-Weather Sextant

This new sextant is a permanently installed ship's instrument which in no way affects any existing instrument on shipboard and is in no way affected by them. The instrument consists of two devices, the sextant proper, which is the hand held instrument, and the amplifier with its batteries. The amplifier, which is contained in a case 8 x 9 x 20 inches, is permanently installed in the wheel house with rigid conduits leading from it to both flying bridges, where convenient receptacles are placed for plugging-in the two short flexible cables attached to the sextant.

In operation the navigator adjusts the amplifier, a process requiring about two minutes, steps out on the bridge, plugs the flexible cable attached to the sextant into the outlet, and takes his observations as often as he desires.

The necessary calculations for fixing a definite position from solar observations taken by this sextant are substantially the same as those required for standard sextants. Index error, parallax and refraction are similar, dip is eliminated but is replaced by a special temperature correction, while semidiameter is entirely eliminated.

The Macneil all-weather sextant is not an optical instrument. It detects certain infra-red or invisible rays originating in the sun after they pass through or are the cause of re-radiation by clouds, fog, etc. The artificial horizon used is an entirely new development, is extremely easy to handle and very accurate.

Nickel Condenser Tubes

CONDENSER tubes containing 30 per cent nickel and offered for service in all fields where corrosion interferes with the satisfactory operation of marine or stationary condensers are offered by the American Brass Co., Waterbury, Conn. While the company cannot guarantee a definite life for its Anaconda Super-Nickel and Ambrac condenser tubes, owing to the many variable factors involved, it is convinced that these tubes will justify their cost, particularly in view of the increasing tendency to utilize high velocity cooling water with high pressure turbine installations. Convincing records have

been made by these tubes in polluted and highly corrosive waters of a world-wide range and where the temperature of the water used for condensing purposes rises to 95 degrees Fahr. Within the last year Cupro-Nickel condenser tubes have had a marked impetus because of its adaptability to the most corrosive sea water conditions. New ships of the United States lines, Roosevelt line, Canadian Pacific Steamship Co., the United States navy and the United States coast guard service have been or are being equipped with them.

Sonic Locator to Warn Navigators in Fog

BULLETS of sound, which bound back to the boat from which they are sent and warn the pilot of fog-screened obstacles in his path, have been employed in an acoustic navigating device announced by Chester W. Rice, an engineer of the General Electric Co. and successfully operated off New London, Conn. The new device is termed a sonic locator, and is a direct outgrowth of the sonic altimeter recently developed as an aid to fog-flying.

As the sonic altimeter tells the airplane pilot his distance from the ground and indicates the presence of projecting hills or buildings, so does the sonic locator, by using the sound-echo principle, warn the navigator of boats, buoys, or shoreline which may be totally obscured by fog.

A sending megaphone mounted on the boat projects short blasts of a high-frequency air whistle, similar to bullets shot from a gun. These blasts strike objects ahead and rebound as echoes. The number of seconds elapsing during this interval determines the distance of the objects from the boat in plenty of time for the pilot to avoid hitting them.

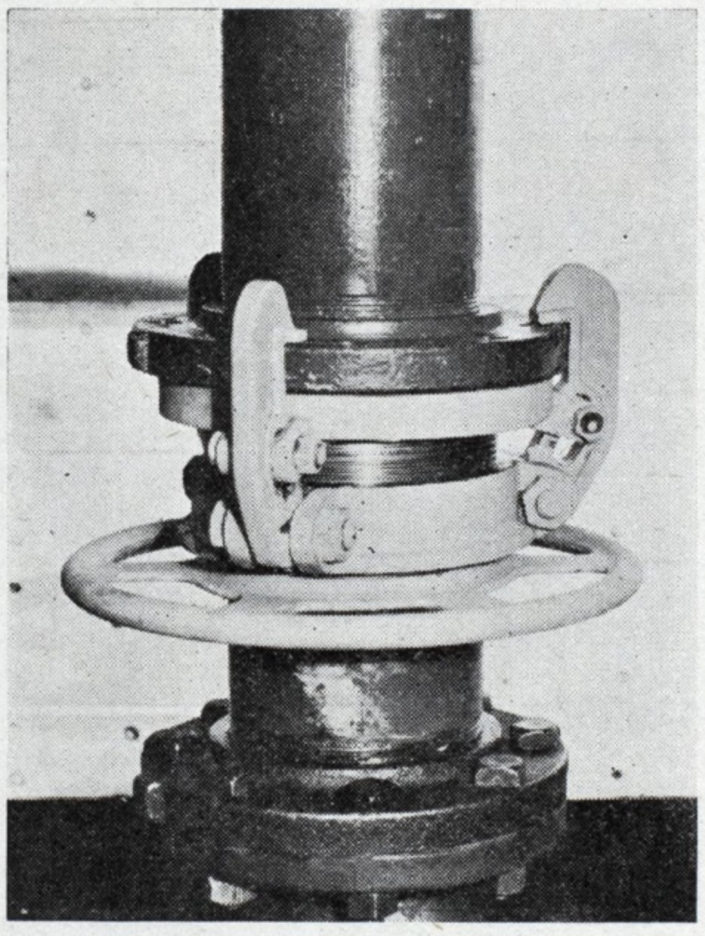
In the operation of the device on the WANAGO off new London, wind and sea appeared to have very little effect on the range obtained. The boat was run at its normal cruising speed, 12 miles per hour, and by taking soundings at five-second intervals, the average distance at which objects could be picked up ranged from 800 to 2700 feet, the pick-up time ranging from 2½ to 5 seconds.

New Liquid Rubber Has Many Uses Aboard Ship

A NEW development of interest to ship and boat owners was demonstrated on April 4 at the Fletcher plant of the United Dry Docks in Hoboken, N. J. At this time the ARGUS, patrol boat of harbor supervisor, was covered below the water line with seavulc, a new liquid rubber. The application was witnessed by shipping men from all parts of the port of New York. It is claimed that this rubber coating, which is applied as paint, will successfully prevent marine growth, corrosion and galvanic action.

The new product, made by the Colvulc Rubber Co., Norfolk Downs, Boston, is 90 per cent pure liquid rubber and is said to be the only liquid rubber which can be applied cold and cures cold. It resists all acids except nitric and chromic and its life is double that of vulcanized sheet rubber. Ageing-oven tests up to 10 years have failed to destroy the compound. By actual test with a blow torch it required 7½ minutes to raise a blister on Seavulc and upon cooling the blister immediately disappeared.

Another product called Colvulc, (Seavulc in paste form) is used for propellers and tail shafts to prevent electrolytic action. It is also used to permanently attach rubber tiling to steel decks and makes an excellent surface for decks where no tiling is used.



Hercules Safety Hose Coupling

Hercules Safety Coupling

A NEW device for the quick attachment and detachment of large hose has just been placed on the market by the Thomas Laughlin Co., Portland, Me. This coupling was invented by Capt. Percy Farmer of Portland and before being placed on sale a long series of experiments and tests were made of many different designs, including placing a coupling of one of the earlier designs in actual use at an oil terminal.

In its present form the Hercules coupling is simple and rugged. A connection made with it is positive and just as secure as the present approved method of using bolted flanges. The time occupied in connecting hose with the coupling is less than one minute and the detachment is almost instantaneous.

The Hercules coupling differs from other couplings in the fact that it is entirely self-contained on one side of the joint and the connection may be made to a standard flange by turning one wheel. All moving parts are made of manganese bronze and where corrosion might affect the operation a good quality of composition is used. The coupling should prove popular in the oil trade where much attention is given to mooring a tanker at an oil wharf in a manner which will permit moving the ship away quickly in case of fire. The coupling is now offered in 4, 6, and 8-inch pipe sizes. If trade requirements warrant, other sizes will be developed later.

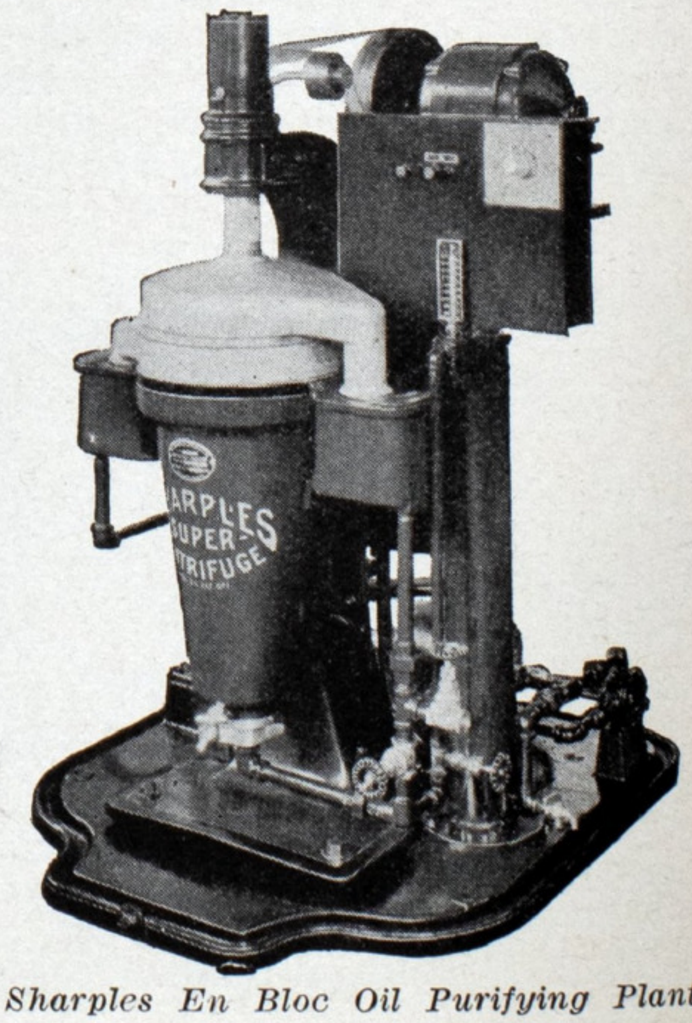
Geo. B. Drake, 17 Battery place, New York, has been made sole sales representative for the United States and Canada.

New Oil Purifying Plant

A NEW model complete oil purifying plant designed especially for purification of diesel engine fuel and lubricating oil, turbine and other miscellaneous kinds of lubricating oil, is announced by the Sharples Specialty Co., Philadelphia.

The EnBloc model is a complete oil purifying plant in itself, combining an oil purifier of high centrifugal force with pumps, heaters, push button controls and accessories all mounted on a common base and piped and wired together so that the installation requires but two pipe connections and one electrical connection. The unit is installed with ease and operated with a minimum of attention.

The Sharples Super Centrifuge of the enclosed vaportite model is used to remove impurities such as dirt, grit, carbon, sludge and water from the oil, developing a force of over 13,000 times gravity.

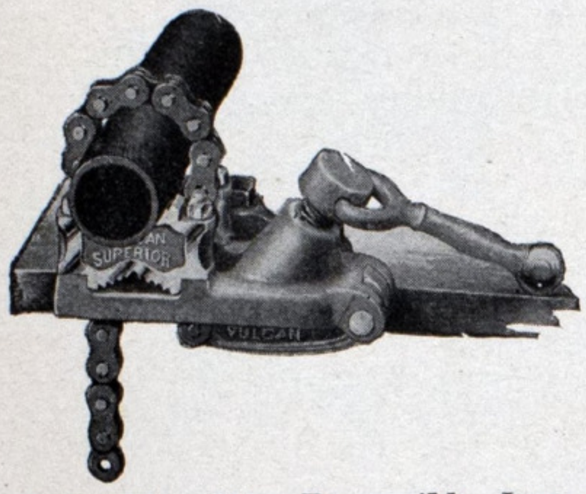


Sharples En Bloc Oil Purifying Plant

Reversible Jaws Feature Chain Pipe Vise

A CHAIN pipe vise, a type of equipment which has considerable application in the marine field and which is said to have advantages over the older style of similar units has been produced by J. H. Williams & Co., located in Buffalo.

The two chief advantages claimed for this vise include an overhead adjustment feature, with the handle on top where it is easy to operate



Chain Vise Has Reversible Jaws

and reversible jaws which contribute to the longer life of the unit. The operation of reversing the jaws consists simply in unscrewing bolts and turning the jaws over.

The manufacturers state that the vise is of great capacity, taking pipe ½-inch larger than other chain pipe vises of similar size.

It is wholly made from tough wrought steel. According to the makers, no castings are tolerated. The base is drop forged as also are the jaws, handle and chain arm. The chains are said to be of the same quality as those of the chain pipe tongs made by the same company. The chains are said to be unbreakable, compact, rapid in action and positive in grip, and are fully guaranteed by the manufacturers.

These vises are attractively finished in chrome-plate and are furnished in two sizes for ⅛ to 4½-inch pipe.

Single Rheostat Controls Entire Welding Range

A 200 amprere, single-operator welding set, designed to meet practically every requirement in both shop and field, has been produced by the Westinghouse Mfg. Co., East Pittsburgh, Pa. This unit is simple in operation and compact in construction.

The set is started by connecting directly across the line by means of a linestarter and linestart motor. Starting and stopping are accomplished by the simple operation of a pushbutton. A single rheostat varies the arc current over the entire welding range. Accurate adjustment over the welding range, from 60 amperes to 300 amperes, is afforded by steps of 5 amperes.

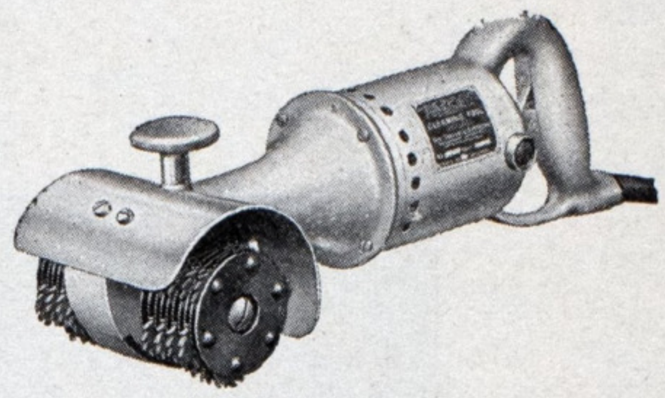
The motor-generator, and control equipment are assembled in a totally enclosed frame. The exciter, which is overhung from the motor end, is securely fastened to the unit frame. This type of construction guards the operator against injury, and protects the set from dirt and falling objects. In performance tests welding operations have been carried on while the sets were suspended at every angle that could possibly be required in any application. Operation is as satisfactory when the set is placed on end, as when it is in the normal position.

Steady welding current, insuring thorough penetration and fusion of the weld, is obtained from a constant current generator. A separate exciter is used in all Westinghouse single-operator wedges. It insures a high-speed welding, and a machine whose generator voltage responds to any changes in arc conditions, this tending to maintain a constant rate of fusion of the electrode.

The unit is rated at 200 amperes, one hour, 50 degrees rise on a resistance load at 25 volts conforming to the standard rating of the National Electrical Manufacturers association. The motor is wound for 220 or 440 volts and is assembled with the necessary connections made for operation from a 3-phase 60 cycle circuit. If it is desired to operate the unit from a 440 volt, three-phase, 60 cycle circuit, it is only necessary to replace the operating coil on the magnetic starter, and to reconnect the motor leads.

Tool Used for Cleaning Steel Surfaces

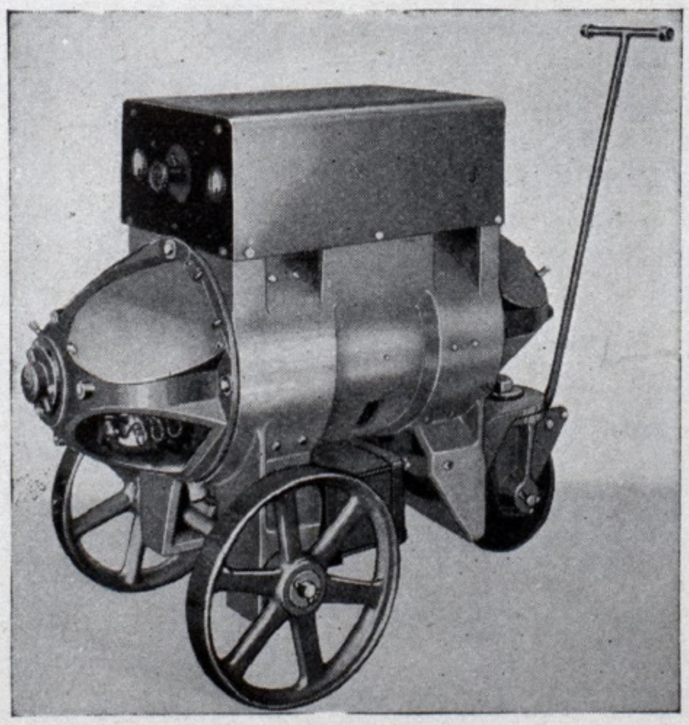
A USEFUL cleaning tool for removing paint, rust and scale from steel surfaces, produced by the Concrete Surfacing Machinery Co., Cincinnati, is shown in the accompanying illustration. With this machine, known as the Berg tool, one man can quickly cover large areas and produce a bright clean, smooth finish for the perfect adhesion of new paint. The makers claim it is invaluable for cleaning bridges, viaducts, steel structures, boilers, coal bunkers, tanks, gas holders, barges,



Berg Cleaning Tool

decks, dry docks, stacks, steel cars, ships, ash hoppers, vats, gondola cars, trucks, etc.

The tool is light, weighing only 8 pounds, is portable and easily operated. It is made in two models, electric and pneumatic. A General Electric universal motor, that can be supplied for either 110 or 220 volts, is used on the electric model.



Welding Set for One Operator

Modern Chain Wheels Are Readily Adjusted

WELDED link chain is desirable for conveying of power and materials not only because of its strength but also its extreme flexibility, permitting operation at many angles and at many directions in the same line. Chain wheels further enlarge this field by making chain conveying more economical and efficient.

Warwick chain wheels, supplied by the Newhall Chain Forge & Iron Co., 9-15 Park place, New York, are adaptable to various styles of chain, having a simple diameter adjustment feature to follow up and take up chain wear that would make the old style, solid wheel, worthless. Continual proper chain fit assures longer life to both the chain and wheel.

In the Warwick chain wheel the center is the only part attached to the shaft and gets none of the chain wear. It can be supplied with or without a flanged rim for a chain guide or the teeth may have such a guide. The teeth take all of the chain wear, are made of harder material and can be quickly adjusted to the proper chain fit or can be replaced without removing the wheel from the shaft or the chain from the wheel. They are made in various styles including the sprocket and pocket separator type, and are adaptable to various types of chain.

Where greater chain anchorage to the wheel is necessary, a combined sprocket and pocket wheel can be supplied by alternating the teeth, an entirely new feature. A sprocket wheel can be changed over to a pocket wheel by changing the teeth.

Personal Sketches of Marine Men

Capt. Joseph S. Wood, President, Lake Carriers' Association

By E. C. Powers

AT the age of 24, a thoroughly experienced seaman and navigator, he received his first command as captain of a lake freighter.

HAS the distinction of having served the same line as seaman, mate, captain, marine superintendent, vice president and president.

BY his election as president of the Lake Carriers' Association a year ago he became the recognized leader of lake shipping interests.

WITH a grandfather who had been an arctic whaler and an uncle who had sailed before the mast, it might be said that Capt. Joseph S. Wood, president of the Wilson Transit Co., Cleveland, and also president of the Lake Carriers' association, came naturally by his aptitude for a notable career in Great Lakes shipping.

Captain Wood was born July 14, 1874 at Forsythe, Marquette county, Mich. where his father was superintendent of the Cheshire mine. He attended school in a little log school house in his native town until he was 13 years of age. In 1887 the family moved to Duluth, where he continued his studies for another two years. Completing school, young Wood worked for two years in the iron mines of the Lake Superior country.

He then found employment with the Spear Shipbuilding Co., Duluth, where he worked under Capt. Alexander McDougal from 1890 to 1892, helping to build the whale back steamer CHRISTOPHER COLUMBUS for the Chicago World's fair. The thorough training he received in shipbuilding proved of great value in his later activities. In 1893 came hard times but his good training continued as he was lucky to get a job as oiler and made two trips oiling and firing and later watching.

And so began his career in Great Lakes shipping. He served as wheelsman on the steamer SAMUEL MATHER in 1894 and the following year he became wheelsman on the steamer OLYMPIA of the Wilson Transit Co., the line of which he was later to become president. About this time, during a period when lake shipping was slack, the young sailor turned prospector and journeyed to Oregon where he dug for gold. Returning to the lakes, he received his mate's papers during the winter of 1895 and sailed as second mate on the steamer OLYMPIA in 1896. He served as second mate on the steamer W. D. REES during the season of 1897 and in 1898 became first mate of the ANDREW CARNEGIE, acting in this capacity until September of that year when at the age of 24 he became master of the VOLUNTEER. At this time another lull occurred in lake shipping activity and he again became a prospector, spending three months in New Mexico looking for gold. Speaking of his gold-hunting experiences in Oregon and New Mexico, Captain Wood remarked, "I had a good time but found no gold."

In 1901 Captain Wood took out the steamer THOMAS WILSON and in the winter of that year was married in Superior, Wis. Soon after his marriage he moved to Cleveland where he has lived ever since. He took out the steamer J. E. UPSON in 1908 and sailed her until 1912 when he came ashore and was made marine superintendent of the Wilson Transit Co. In 1926 he was made vice president and in 1928, at the death of A. W. Thompson who had been president, Captain Wood was elected chief executive of the company.

The Wilson Transit Co. dates back to 1872 when the schooner D. M. WILSON was constructed. The present fleet of the line, which incidentally is one of the oldest of existing Great Lakes shipping companies, consists of eleven bulk freighters, including the large modern steamer WILLIAM C. ATWATER, completed in May, 1925.

In his capacities of marine superintendent, vice president and president, Captain Wood has supervised the construction of all Wilson line boats built since 1912. At the spring meeting of the Lake Carriers association in April, 1931, Captain Wood was elected president, having previously served as a member of the executive committee. He is also a director of the Great Lakes Towing Co.

He is a member of the Cleveland Athletic club, the Union club and the Shaker Heights Country club. He plays golf and enjoys horseback riding. He is the father of four boys.

Elected Vice Presidents of Roosevelt S. S. Co.

At a meeting of the board of directors of the Roosevelt Steamship Co. held April 19 at the New York offices of the company, 1 Broadway, P. V. G. Mitchell, and A. C. Fetterolf were elected vice presidents and A. J. McCarthy was elected general manager. All three of these newly elected executives held similar positions in the International Mercantile Marine Co. which merged in 1931 with the Roosevelt company, managing operators of the American Pioneer line and Baltimore Mail line, and since October, 1931, of the United States lines and American Merchant lines.

Mr. Mitchell has been vice president in charge of passenger traffic of the International Mercantile Marine Co. since 1925 and for seven years prior to that time was general manager of the Red Star line, a subsidiary of the company, at Antwerp.

Mr. Fetterolf joined the International Mercantile Marine Co.'s staff in 1903 as assistant general traffic manager, became freight traffic manager in 1906 and was elected vice president in charge of freight traffic in 1925.

Mr. McCarthy has been associated for 34 years with steamship lines now consolidated under the International Mercantile Marine Co. In 1917 he became a member of the operating staff at New York and in recent years has been manager of the American flag tonnage of the company. He was made general manager in 1931.

The resignation of Frederick Toppin, vice president of the International Mercantile Marine Co. since June 1917, was announced April 6 by P. A. S. Franklin, president of the company.

Officers Are Reelected

At the annual meeting of the stockholders of the United States Shipping Board Merchant Fleet Corp., held April 20, the following were re-elected as trustees: Elmer E. Crowley, S. S. Sandberg, H. I. Cone, A. H. Denton, Jefferson Meyers and R. K. Smith.

Immediately following the annual meeting, the board of trustees, at a special meeting re-elected the following administrative officers of the Corporation: Elmer E. Crowley, president; S. S. Sandberg, vice president; Samuel Goodacre, secretary; Heber M. Wells, treasurer; Lewis D. Parmelee, general comptroller.

General Electric Profits for First Quarter

Orders received by the General Electric Co. for the first quarter of 1932 amounted to $33,404,642, compared with $60,366,297 for the corresponding three months of last year, Gerard Swope, president of the company, announced at the annual meeting of stockholders held in Schenectady today.

Sales billed for the first three months of 1932 amounted to $37,876,399.05, compared with $61,959,800.90 for the period last year.

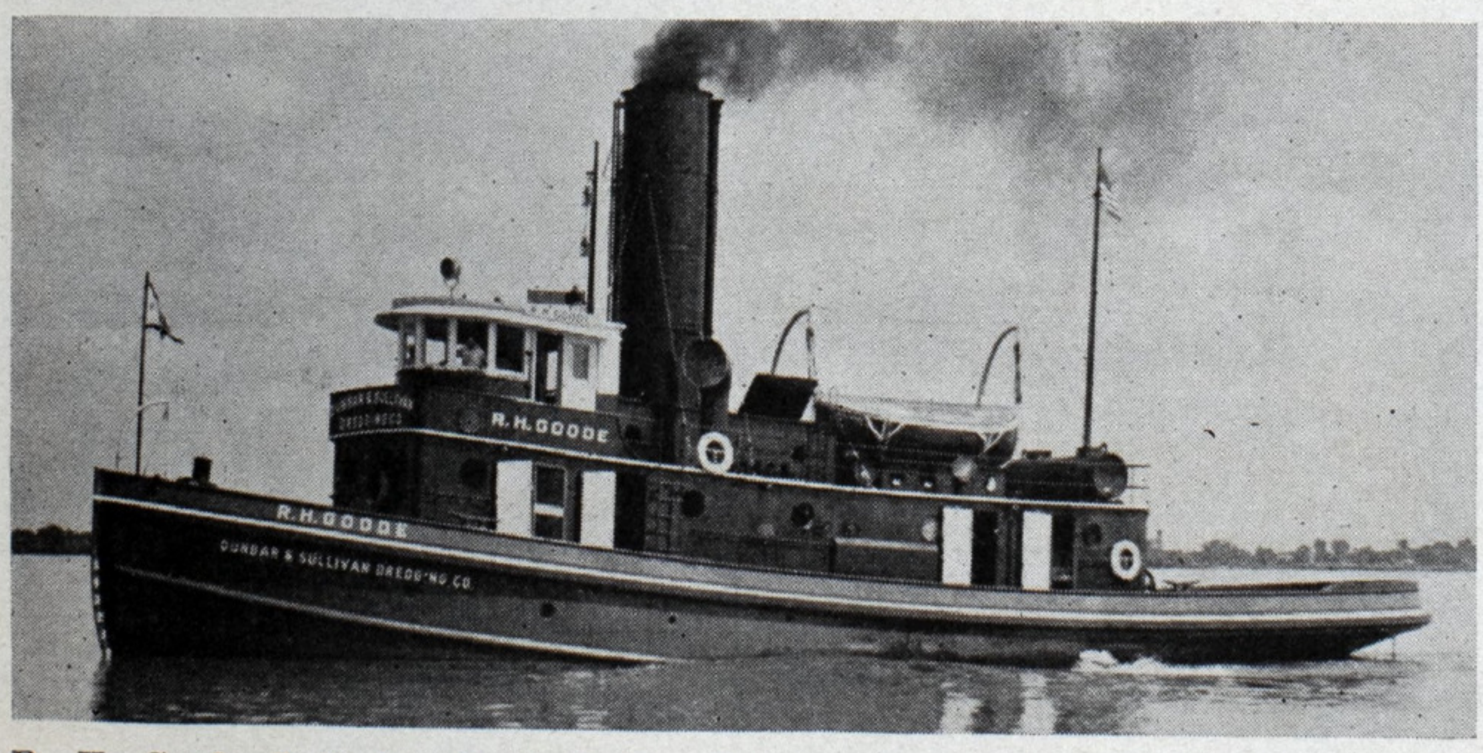
Profit available for dividends on common stock for the first quarter of 1932 was $4,508,667.85, compared with $10,844,334.09 for the same three months last year, which is equivalent to 16 cents per share in 1932 and 38 cents in 1931 on 28,845,927 shares outstanding in both periods. The quarterly dividend on the common stock, payable on April 25, is 25 cents per share, compared with 40 cents per share paid a year ago.

Navigation on the New York state barge canal from the Hudson was opened for the season on April 14 when the tanker BURLINGTON from Albany passed through the gates at Waterford.

Large Powerful Tug for Great Lakes Service

THE R. H. GOODE, shown in the accompanying illustration,, though built for the Great Lakes is in practically every respect equal to the larger and more powerful ocean and seaport harbor tugs. A complete steel hull, steam driven, coal burning vessel, she was designed for general towing purposes on the lakes but her ordinary service is in connection with dredging operations for handling large dump scows, dredges and other floating equipment. This tug was designed and built for the Dunbar & Sullivan Dredging Co., Buffalo, by the Great Lakes Engineering Works, River Rouge, Mich. Her appearance is particularly pleasing, powerful and shipshape in every line, the responsibility for which goes to the design staff of the shipyard headed by Dwight True, naval architect, and Howard M. Varian, chief engineer.

The GOODE was launched June 20, 1931, and completed July 23. Her principal dimensions are: Length over all, 102 feet; length between perpendiculars, 90 feet 6 inches; breadth molded, 24 feet 6 inches; depth molded, 14 feet 6 inches. The displacement on a loaded draft of 13 feet 6 inches in fresh water, is 385 tons (of 2000 pounds each). The gross tonnage is 187 and the net tonnage 98. She has a speed of 10½ knots.



R. H. Goode Built by Great Lakes Engineering Works for Dunbar Sullivan Dredging Co. Steel Hull, Single Screw, Compound Steam Engine

A single screw is direct connected through a 21-inch Kingsbury thrust bearing with a fore and aft compound steam reciprocating engine, built by the Great Lakes Engineering Works. The cylinders are 19 and 40 inches in diameter and the stroke is 28 inches. The horsepower is 750 at 115 revolutions per minute.

Steam is supplied by one Scotch boiler built by the Manitowoc Shipbuilding Corp. The boiler is 14 feet in diameter and 12 feet long and the working steam pressure is 160 pounds per square inch. Coal, hand fired is used for fuel.

The equipment includes pumps by Dean Bros. Co.; steering engine, by Great Lakes Towing Co. and electric generators by Pyle National. The propeller was designed and manufactured by Great Lakes Engineering Works. A Kelvinator refrigerator is used for the provision stores.

Diesel Electric Power Plant in Oil Drilling Barge

By L. E. Browne

ALTHOUGH application of diesel electric power in oil drilling is not new, the barge ENERGY, designed and built under the direction of the Texas Co., engineers at New Orleans, embodies many unique ideas as a floating power plant for underwater drilling. This floating electric power plant is successfully employed in oil drilling operations in the bayous and marshes of southern Louisiana along the Gulf coast. The barge is of all-steel riveted construction.

The ENERGY is completely self contained and carries diesel fuel and lubricating oil for a straight run of 20 to 30 days. There is a twin power plant consisting of two Cooper-Bessemer diesel engines driving generating sets totaling 485 horsepower, which is ample for drilling a 6000-foot well. The machinery is mounted on a steel sub-base, providing good alignment and distributing the 13-ton load over the hull framing. Each generating unit consists of a diesel engine driving through flexible coupling, a generator with direct drive exciter.

Two Units Give Flexibility

Power was divided into two units as it was found that during the early stages of well drilling, one unit supplies sufficient power, the second being a reserve. One unit can always keep the drip pipe rotating and pumps operating, enabling repairs or adjustments to the other. Auxiliary equipment is entirely electrically driven, including pumps, air compressors and centrifuge, the latter cleaning the oil used for fuel.

Transmission of power from the barge to the drilling rig required precautions against the possible ignition of gas encountered in drilling. Using oil-immersed switches and gasproof motors, it was also decided to locate the barge approximately 200 feet from the well. Bridging this gap with a conductor weighing 3500 pounds, without undue power loss, at the same time retaining flexibility and easy handling was a problem.

Stranded copper core cable, 1¼-inch, of 427 strands, was selected. The cable is covered with double thickness of rubber insulation, vulcanized in place, forming a one-piece rubber covering one-quarter of an inch thick, flexible, tough and waterproof. Three conductors are required, and since it was not feasible to make three of this size into one cable, they are twisted together and handled as one.

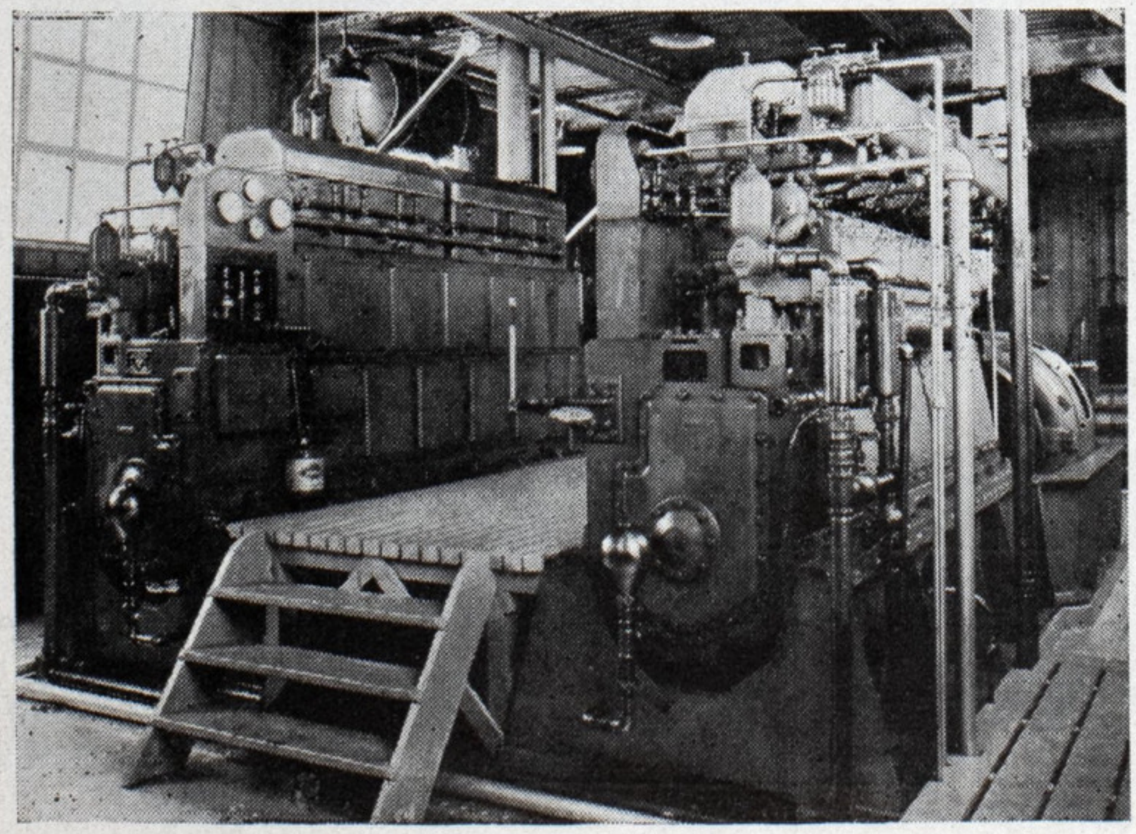
Superstructure Built of Steel

The barge hull is surmounted by a galvanized iron superstructure with walls sloping inward. On the forward aluminum painted deck are located two mooring bits with a windless operating the anchor at the center. In the engine room, a raised steel platform runs between the diesel engines with switches and exciters and other equipment in the background. Above each unit, suspended from the beams of the house roof, is a monorail trolley, with a chain hoist for handling heavy parts in making adjustments or repairs. At the right are located the air compressors and the lighting generators, while at the left are the centrifuge, with its clean oil tank and, overhead, the tank which feeds fuel to the engines by gravity. At the left of the control switchboard is a door leading to the workshop. At the right are the sleeping quarters, which are well lighted and ventilated.

From the forward deck a ladder leads to the walkway on the roof of the house. This walkway extends from end to end of the roof and gives access to the deck insulators and cable reel. On either side are the ventilators in the house roof and the air intake and exhaust pipes for the engines. At the after end of the walkway a ladder leads to the short, open after deck, which is occupied by mooring bitts and by two tanks, one for storing lubricating oil and the other for fresh water. The lubricating oil is piped from the 150-gallon tank directly to the oil pump tank of each engine.

The space in the barge hull under the forward and after decks is separated from the rest of the barge by bulkheads, electrically welded to the hull plating. The bunkers so formed carry 200 barrels of fuel oil and are filled through openings in the deck. Every precaution has been taken to make the plant fireproof, the use of wood has been kept to a minimum.

The engines start from cold at once, when a single switch to admit starting air is thrown. It takes but a moment to adjust the switchboard instruments, and a unit can be placed on the line within two or three minutes.



Engine room of oil well drilling barge Energy for the Texas Co. Two Cooper - Bessemer diesel engines, each direct connected to a generator furnish 485 horsepower for all of the operations in connection with drilling oil wells under water

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Williams, Dimond & Co., steamship agents, San Francisco, recently celebrated the seventieth anniversary of the founding of the firm. At first the firm was known as Williams, Blanchard & Co. It started when the famous clipper ships were carrying the American flag to all parts of the world. A few years after its establishment the firm name was changed to the present form.

More than 32 per cent of Germany's merchant marine is laid up in German ports, a survey revealed on April 10. There are 418 ships totaling 1,190,000 tons in the idle armada. This amount is 5 per cent above January 1, 1932, and double the total of January 1, 1931.

Stockholders of the New York Shipbuilding Co. at the annual meeting approved the retirement of 8,490 shares of preferred stock, 50,756 shares of participating stock, and 27,330 shares of founders' stock, and approved reduction in capital to $14,286,298, from $16,923,275.

The annual report of the Cunard Steamship Co. for the calendar year 1931, shows gross profit of £396,508, but a net loss of £533,204 after provision for depreciation, interest and taxes. No hope is held out for resumption of work in the near future on the superliner now on the ways at Clydebank.

Marine Review

Reg. U.S. Pat. Off.

The National Publication Covering the Business of Transportation by Water

May, 1932

Under the Columbian Banner

Many ships sail under the red, white and blue of Columbian. These colors, which appear as surface markers and also on the *Tape-Marker* have a deeper significance than mere identification.

They mean that the Columbian *Tape-Marked* Rope in which they are placed is the last word in rope—that no one need look any further for the most modern rope on the market.

This waterproofed Columbian is chock-full of extra-long, dependable service. It's fully guaranteed by a manufacturer famous for making good every pledge.

Operators who, especially in these times, insist on getting their money's worth-plus, are buying Columbian exclusively. Its long service gives to Columbian an unusual economy.

COLUMBIAN ROPE COMPANY
440-70 Genesee Street
Auburn, "*The Cordage City*", N. Y.

BRANCHES: NEW YORK CHICAGO BOSTON NEW ORLEANS

COLUMBIAN TAPE MARKED PURE MANILA ROPE

STEAMING LIGHT . . .

AMERICAN SHIPS CANNOT SAIL
EMPTY WITH PROFIT TO THEMSELVES OR THEIR COUNTRY

PATRONAGE IS IMPERATIVE

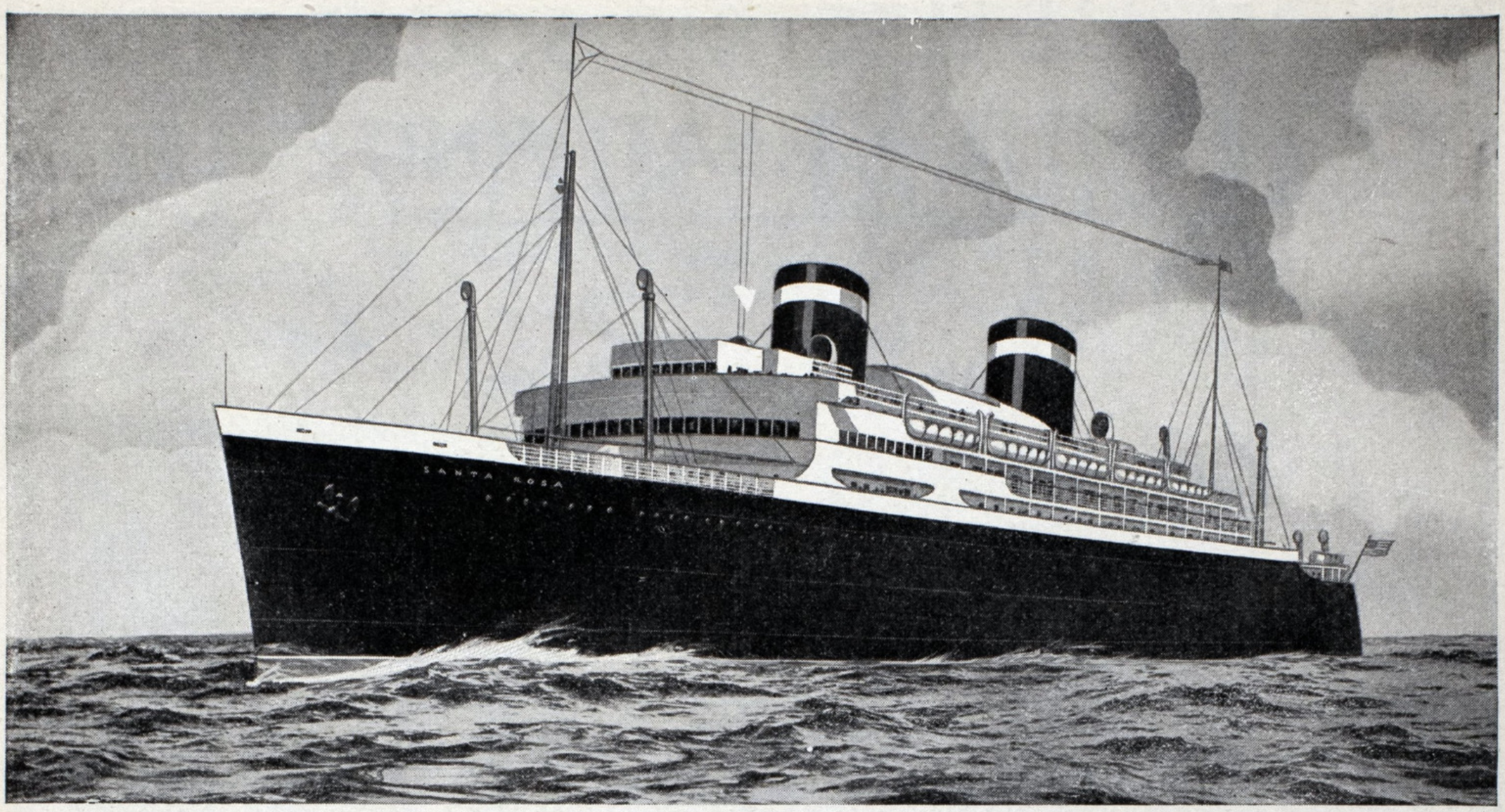
FOREIGN TRADE IS A TWO-WAY BUSINESS AND OUR SHIPS MUST HAVE CARGOES BOTH WAYS.

NEW YORK SHIPBUILDING COMPANY

Main Office and Plant:
Camden, N. J.

New York Office:
420 Lexington Ave.

Vol. 62, No. 5, May, 1932, issue of MARINE REVIEW, published monthly at Cleveland, O. Entered as second class matter at the post office, Cleveland, Ohio, under the act of March 3, 1879. Subscription price $3.00 a year in U. S.; Canada, $4.00; Great Britain, £1; single copies, 35c.



Babcock & Wilcox Boilers

Aboard the First of New Ships

Launched for Panama Mail

BABCOCK & WILCOX
Marine Products

Water-Tube Boilers
Superheaters
Economizers
Air Heaters
Stokers
Oil Burners
Refractories
Oil Separators

The first of the new ships to be launched for the Panama Mail Steamship Company, the S.S. *Santa Rosa*, is equipped with Babcock & Wilcox Boilers.

It is interesting to note that, while these boilers are of a special design specified by the owners and little time was allowed for delivery, they were shipped before the contract date and installed in the *Santa Rosa* before the vessel was launched. Thus a substantial saving was made in the total cost of the ship.

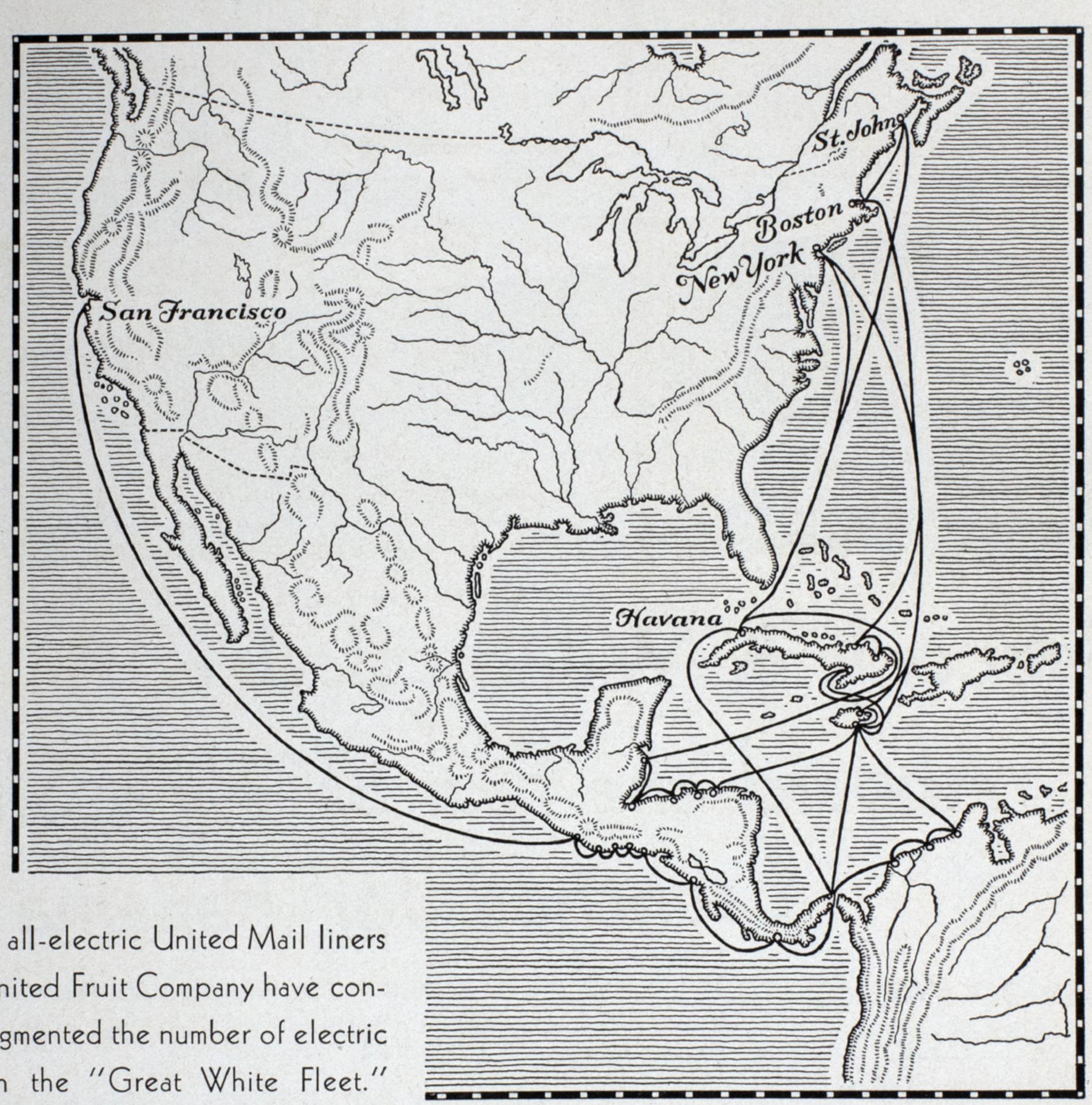
The S. S. *Santa Luisa* will also leave the ways with Babcock & Wilcox Boilers which are now being installed. This ship will be the third of four new vessels to be launched by the Federal Shipbuilding and Dry Dock Company for the Panama Mail and Grace Steamship Companies.

THE
BABCOCK & WILCOX
COMPANY

85 LIBERTY ST. NEW YORK, N. Y.

THE BABCOCK & WILCOX COMPANY — STEAM

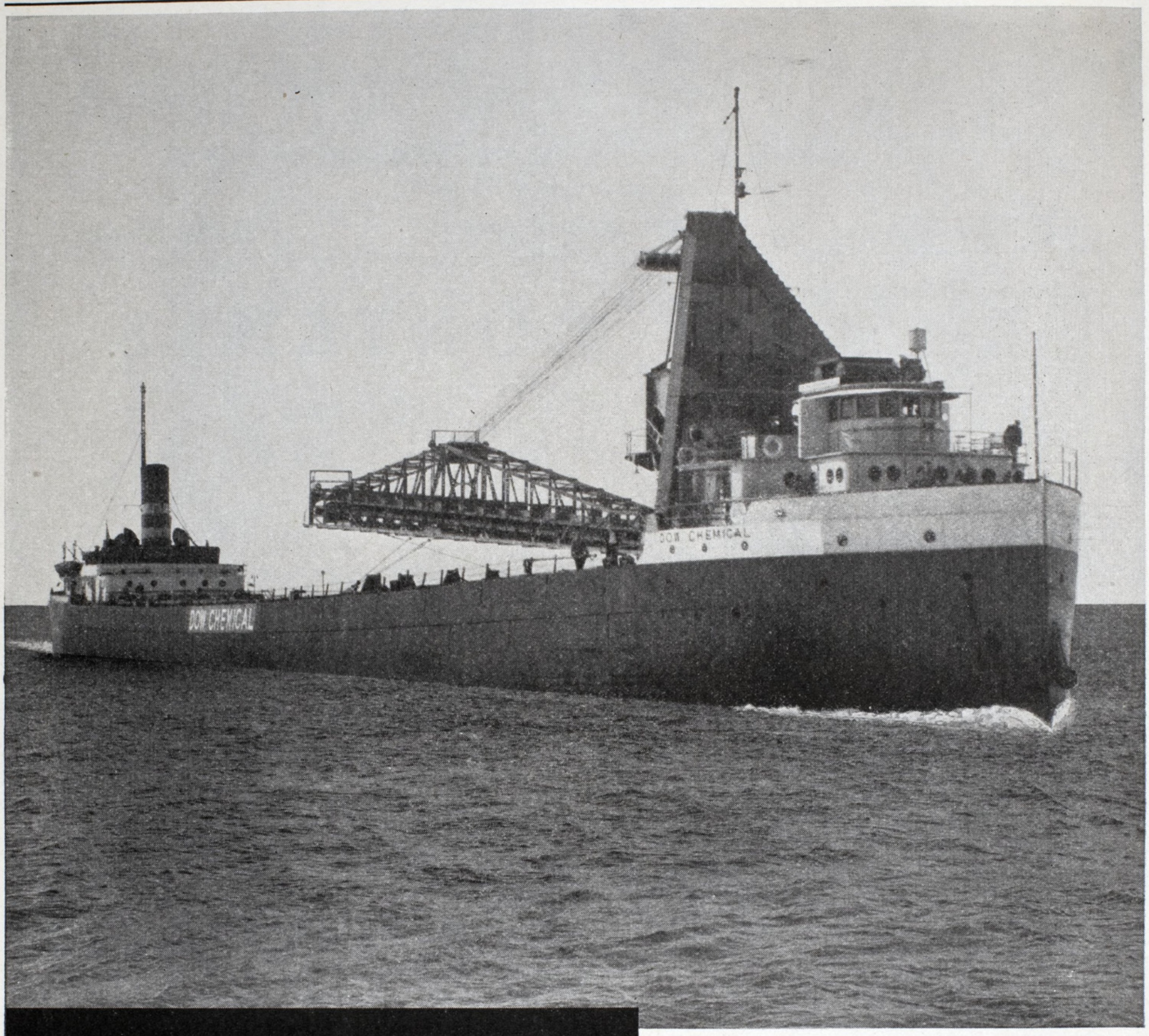
A NEW ALL-ELECTRIC SQUADRON JOINS THE "GREAT WHITE FLEET"



THE new all-electric United Mail liners of the United Fruit Company have considerably augmented the number of electric units within the "Great White Fleet." The *Talamanca*, *Chiriqui*, *Antigua*, and *Quirigua* have already passed their sea trials and are plying the Atlantic, Pacific, and Caribbean waters, carrying both passengers and cargo. The *Veragua* has been launched and will go into service shortly. The complete electrification of these additions to the United Fruit Company's fleet of 115 merchantmen is the result of experience gained in some 30 years of successful shipping in American waters. • It is significant that in building for a well-ordered future, the United Fruit Company has chosen G-E propulsion equipment and auxiliaries. • Through the experience they have gained in developing electric ship propulsion and in adapting it to all types of vessels, General Electric marine engineers in Schenectady, N. Y., can offer expert advice in any problem you may have.

173-28

GENERAL ELECTRIC



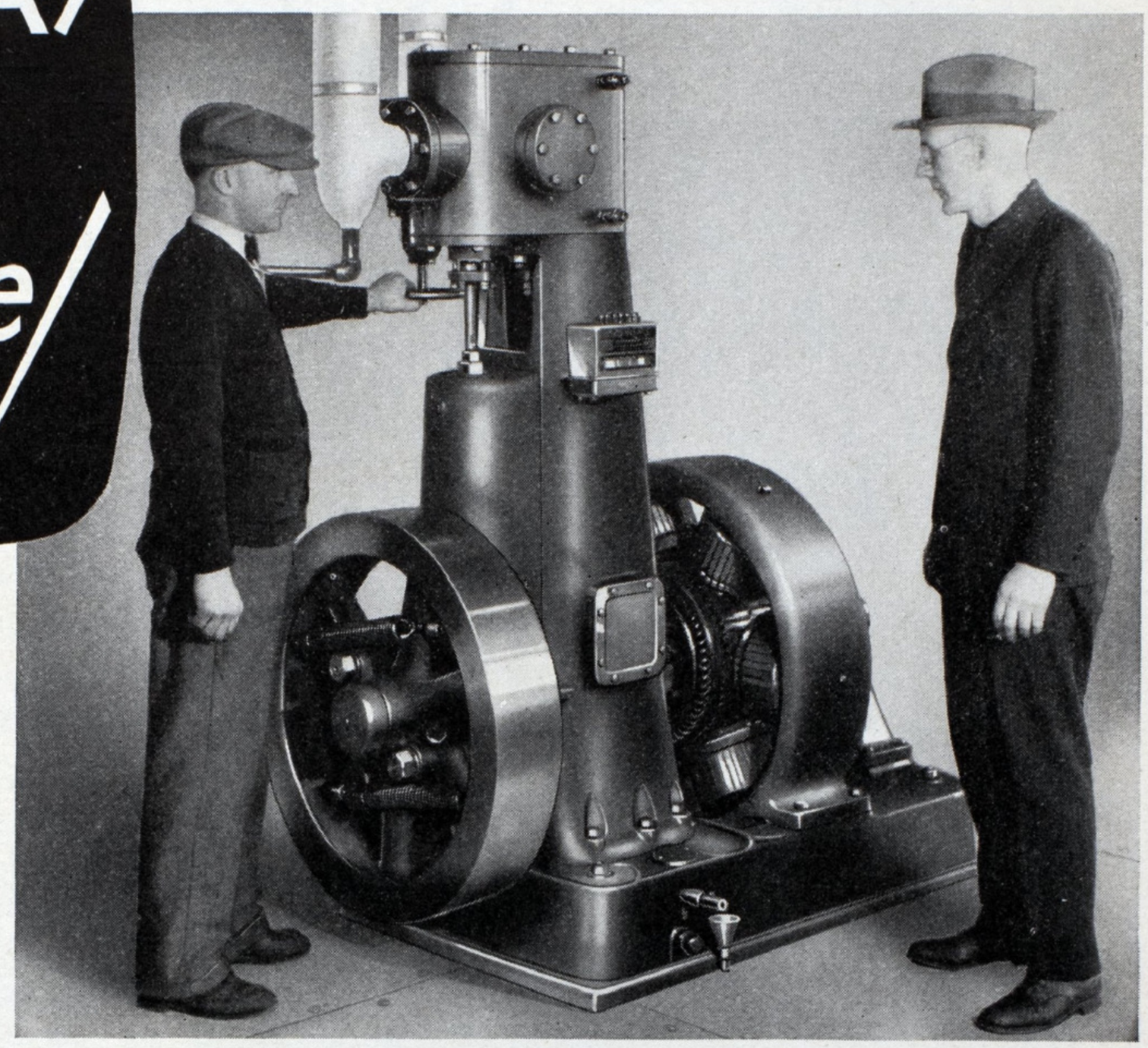
Economy!

. . . SHIP conversions, changes, alterations or improvements, aiming at ultimate economy, are only effective when accomplished! Let's put *your* plans into action!

The AMERICAN SHIP BUILDING CO.

CLEVELAND	LORAIN	BUFFALO	SOUTH CHICAGO	SUPERIOR
American Ship Building Co.	*American Ship Building Co.*	*Buffalo Dry Dock Company*	*Chicago Ship Building Co.*	*Superior Shipbuilding Co.*

UNDERWAY at Once!



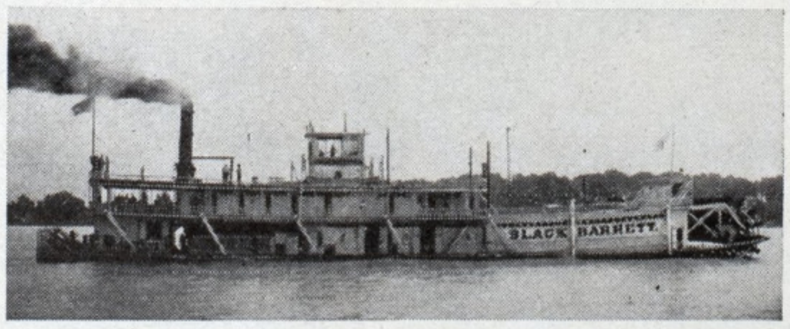
The quick starting Troy-Engberg Marine Generating set.

TROY-ENGBERG generating sets respond immediately to service requirements. They need no elaborate warming up as their design and construction eliminate the possibility of damage from rapid, unequal expansion.

This feature saves preliminary work by the operator and makes it possible to quickly transfer the load from one machine to another or to quickly throw a machine on the line to take care of sudden increase in load. As a result, ship efficiency is increased.

Back of Troy-Engberg generating sets is forty-five years' marine experience which has developed features that have brought them real acknowledgment of superior equipment.

The low *maintained* steam rate of these sets lowers costs and *keeps them down*. The simple and dependable governor which maintains constant voltage, plus the self-oiling features without any oil leakage, are but a few of the refinements of Troy-Engberg generating sets which assure their owners a long life of economical operation. It will pay you to secure additional data on these Marine generating sets. It is available to you for the asking. Write for it.



The tow boat "Slack Barrett" of the Barrett line, Cincinnati, Ohio, equipped with Troy-Engberg generating sets.

TROY ENGINE & MACHINE CO.

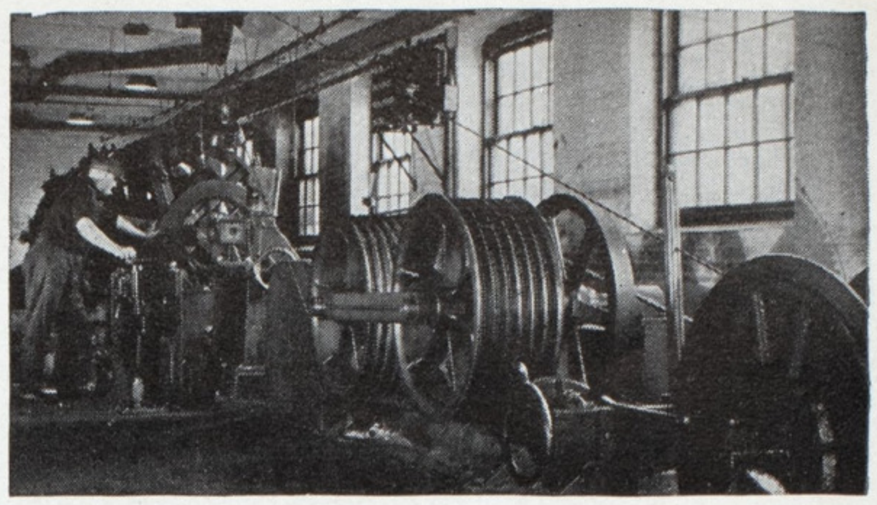
2249 Railroad Avenue *Troy, Penn.*

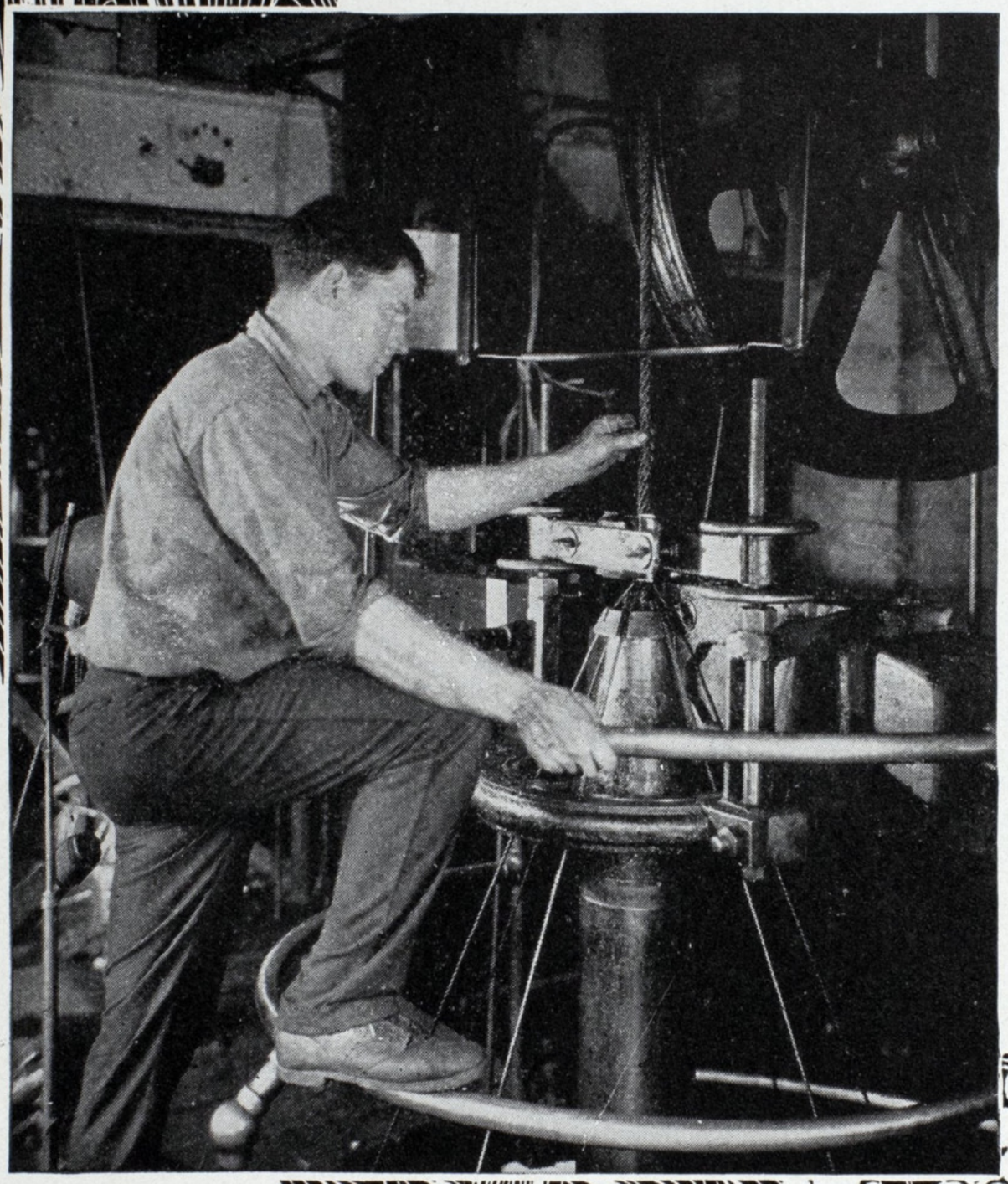
TROY-ENGBERG

MARINE GENERATING SETS, DC OR AC • GENERATORS • STEAM ENGINES

M-32-3

Where Wire



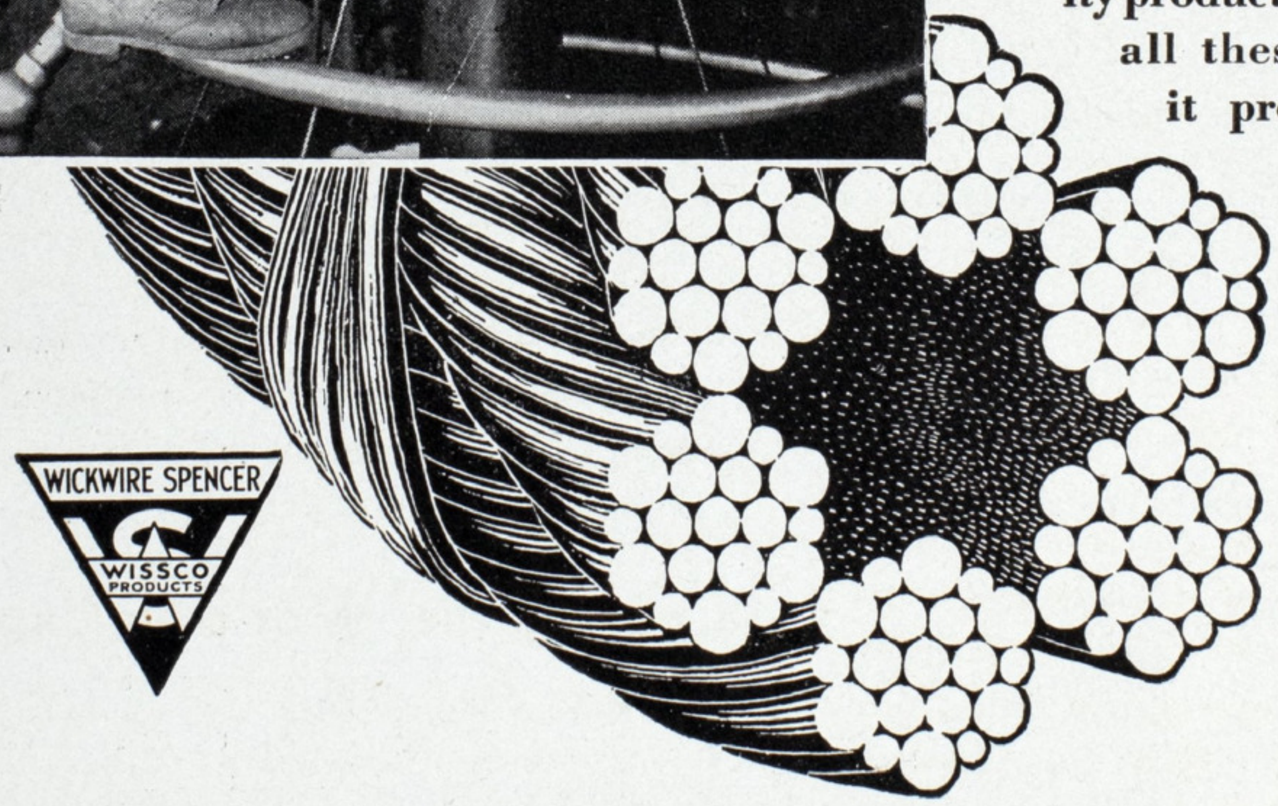


becomes ROPE

Reels of strands spin around and around ...finished rope creeps out...you stop and stare in mute wonder at this hurdy gurdy that changes wire and fibre core into ropes of steel.

So much for the machines that form the rope.

But in the Wickwire Spencer Mills, from the time the ore is smelted, ingots cast, billets formed, rods rolled and wire drawn, right down to the final fabrication, every process has its romance, its technicalities, its points that must be considered to produce a quality product. Wickwire Spencer controls all these processes . . . therefore it produces Quality Wire Rope.



Wickwire Spencer Steel Company, 41 East 42nd Street, New York City

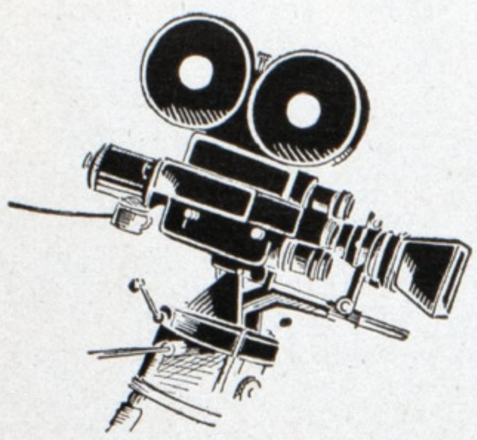
Buffalo, Chicago, Detroit, Philadelphia, Worcester, Tulsa, 314 East Archer St., *Pacific Coast Headquarters:* **San Francisco;** *Branches and Warehouses:* **Los Angeles, Portland, Seattle;** *Export Sales Dept.*, **New York City**

WIRE ROPE

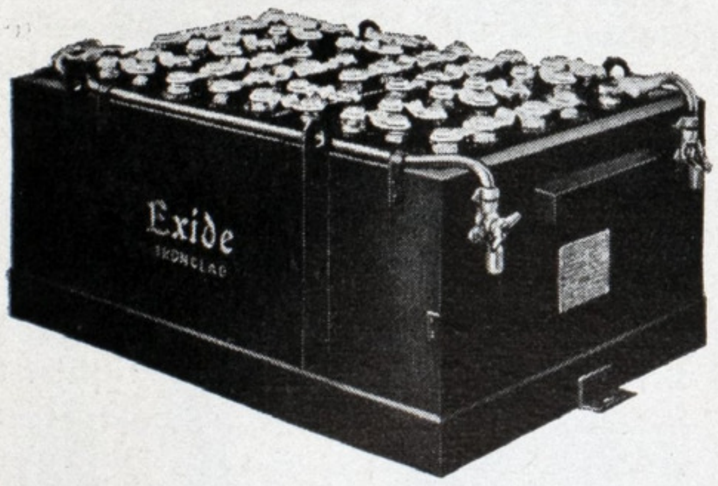
Send for our book. It is free and will prove of great value.

by Wickwire Spencer

The camera tells WHY!

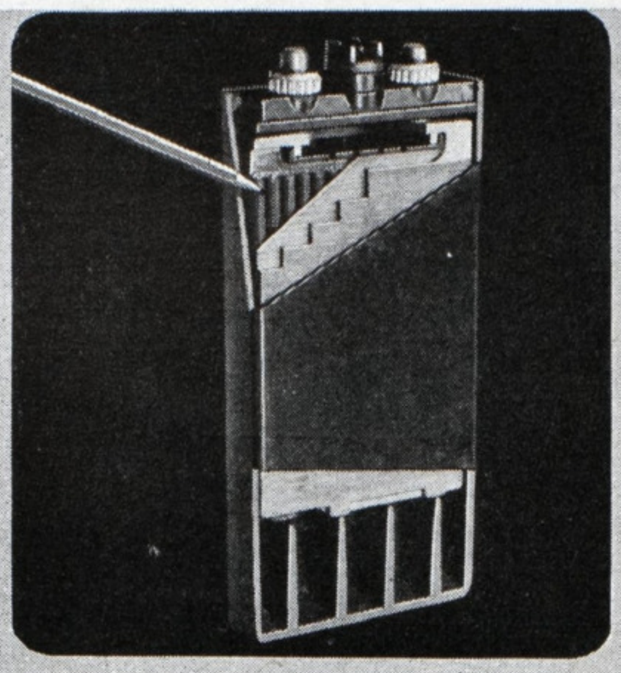


See why the Exide-Ironclad Battery costs so little to operate —lasts so long

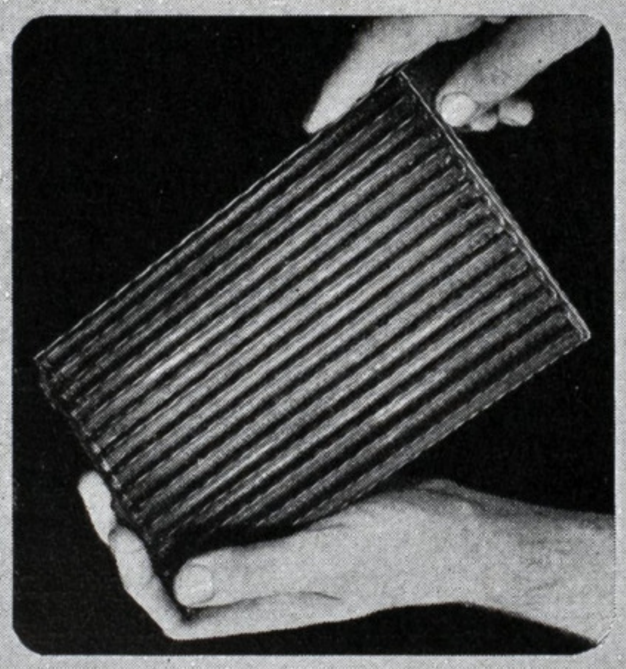


Find out today more about this Exide-Ironclad Battery for Industrial Trucks . . . how it can save you real dollars.

Exide
IRONCLAD
BATTERIES

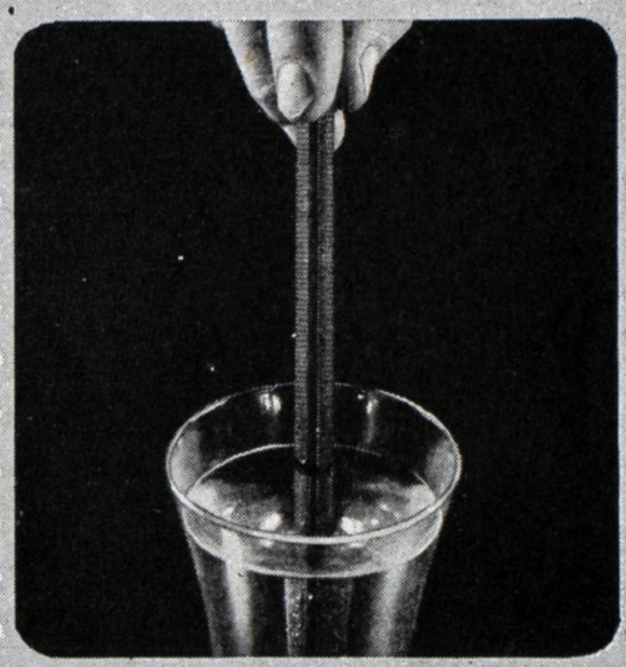


HERE YOU SEE an Exide-Ironclad cell, cut away to show its unique construction. A construction different from that of any other battery made. Not made different just to be different, but a construction that assures low operating costs and a long, active life of absolute dependability in every type of industrial truck service. The pencil points to the positive plate of the Ironclad cell.

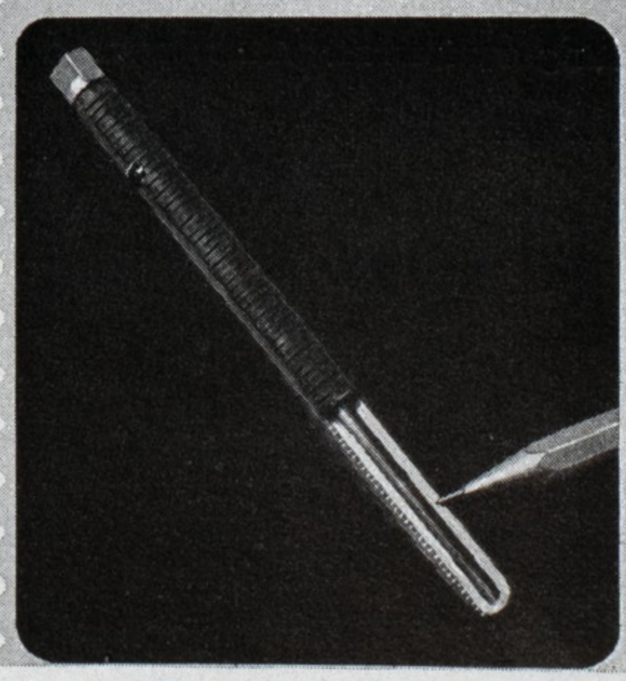


ONE OF THE REASONS for the long, economical life of the Exide-Ironclad Battery—the positive plate. Close inspection reveals a series of cylinders or tubes. These tubes are of hard rubber, ribbed front and back and horizontally slotted for their entire length. Tubes are filled with active material.

A CLOSE-UP of one of the slotted tubes of which the positive plate is composed. Immersed in liquid it shows how the electrolyte meets the active material imprisoned within the tube, through the slots in the tube; but cannot wash it away. This means sustained power over an unusually long life in the toughest industrial truck service, plus economy of operation. Many letters in our files from users testify to this (copies on request).



THE SLOTTED RUBBER TUBE cut away to show the active material within. Also conducting core rod running through the centre of the tube. The cylindrical construction of the tubes of the positive plate resists distortion because of the fact that expansion and contraction is equal in all directions.



THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

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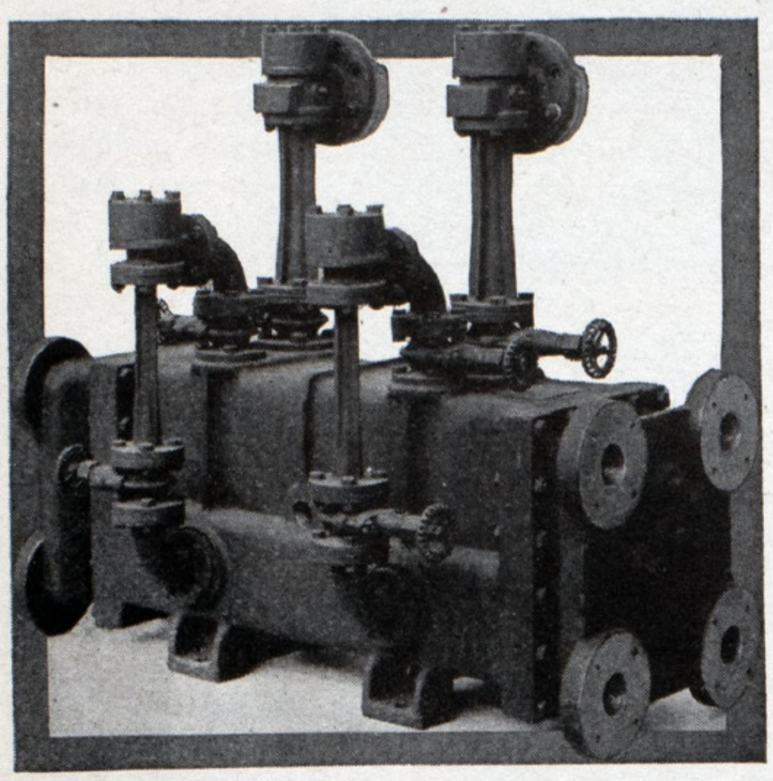
Exide Batteries of Canada, Limited, Toronto

AIR EJECTORS *that are* ON TOP

SAVE SPACE

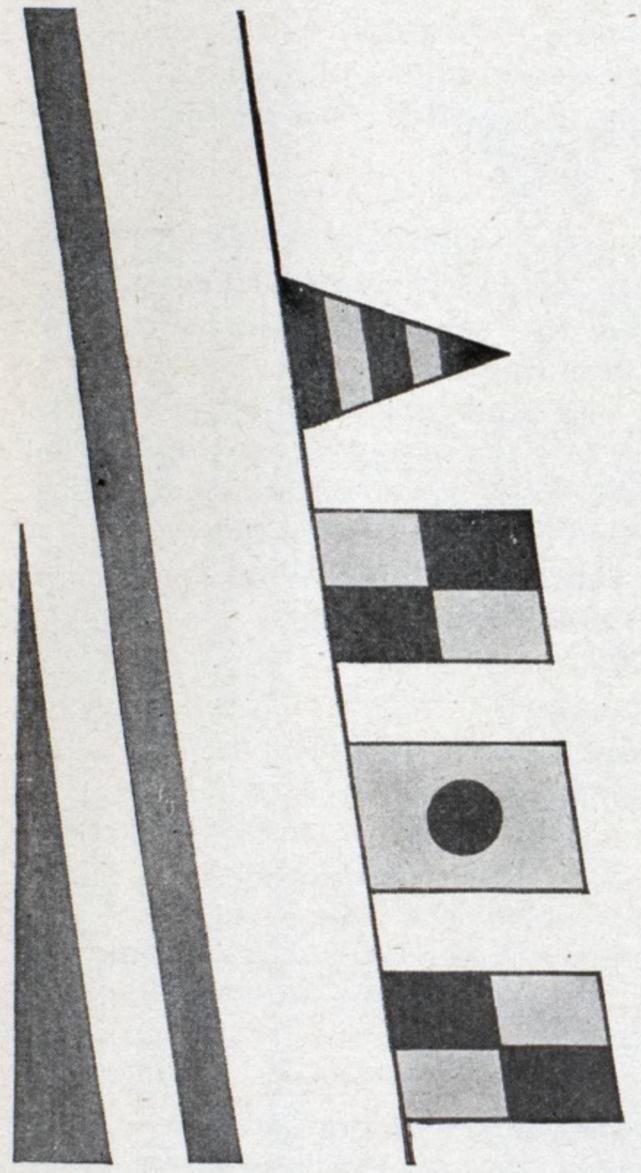


Typical Westinghouse Steam-jet Air Ejectors with intermediate and after condenser.

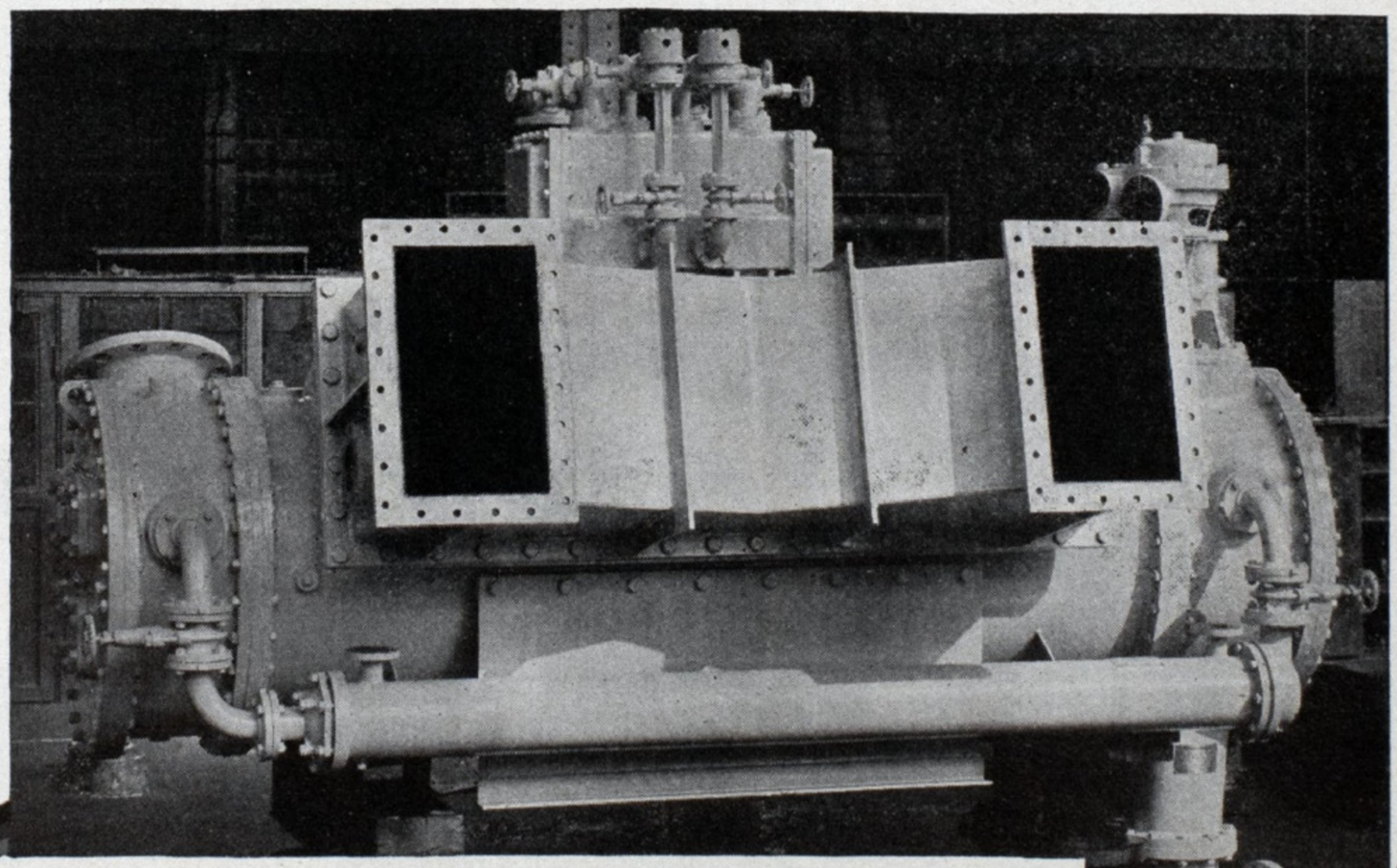
IN the simplified condenser for yachts, tugs, ferries, work boats, and small cargo vessels, the air ejectors are on top of the shell—out of the way and off the engine-room floor, where space is at a premium.

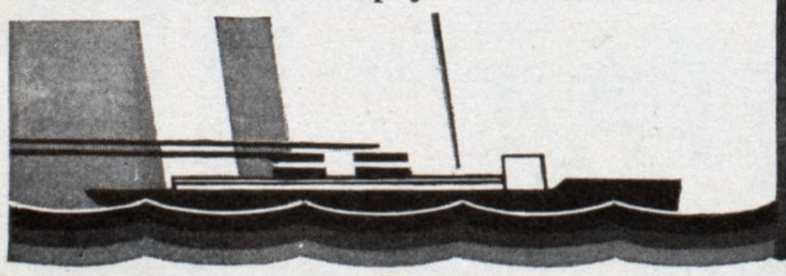
Air ejectors are applicable to all types and sizes of surface condensers, but because of their extreme simplicity and small size, they are especially adapted to the Simplified Condenser—a condenser which is exclusively Westinghouse and which saves space by combining the condenser shell and three of its auxiliaries on one foundation.

Steam jet air ejectors have no moving mechanical parts, there is nothing to adjust, thereby eliminating maintenance costs. Thermally, they are the most efficient means of air removal. Wherever they have replaced wet air pumps, they have either effected fuel savings, or increased the ship's speed, or both.



A 1080 sq. ft. Westinghouse Simplified Condenser installed on the "Harry B. Williams". Westinghouse Air Ejectors similar to those above are mounted on top of the condenser shell.





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R. C. Huffman Construction Co., dredge "Number Three" fitted with F-M 735-hp. Model 37-c-14 Diesel Engine, connected through magnetic clutch to 18-in. dredging pump.

R. C. HUFFMAN CONSTRUCTION CO.

equips new dredge with F-M DIESELS

Economy and dependability reasons for choice

Low fuel costs, coupled with low operating and maintenance charges and the high degree of reliability of F-M Diesels were considerations which prompted the R. C. Huffman Company Ltd., of Toronto, Canada, to install F-M Diesels in their new dredge, "Number Three," shown here.

This company, and the R. C. Huffman Construction of Cleveland, Ohio, have used various types of prime movers under almost every conceivable type of operating condition. They operate twenty - six dredges and tugs. Fifteen of these are fitted with F-M Diesel engines, ranging in size from 45 to 785 horsepower.

The fact that they have so repeatedly installed F-M Diesel engines is convincing evidence of the successful experience that they have had with them. Furthermore, the unexcelled F-M Service organization assures parts and service wherever their fleets may be operating.

F-M Diesel engines have demonstrated unusual economy and reliability in all branches of marine service. The facts will interest you. They will be presented without obligation by a Fairbanks-Morse engineer. Literature upon request.

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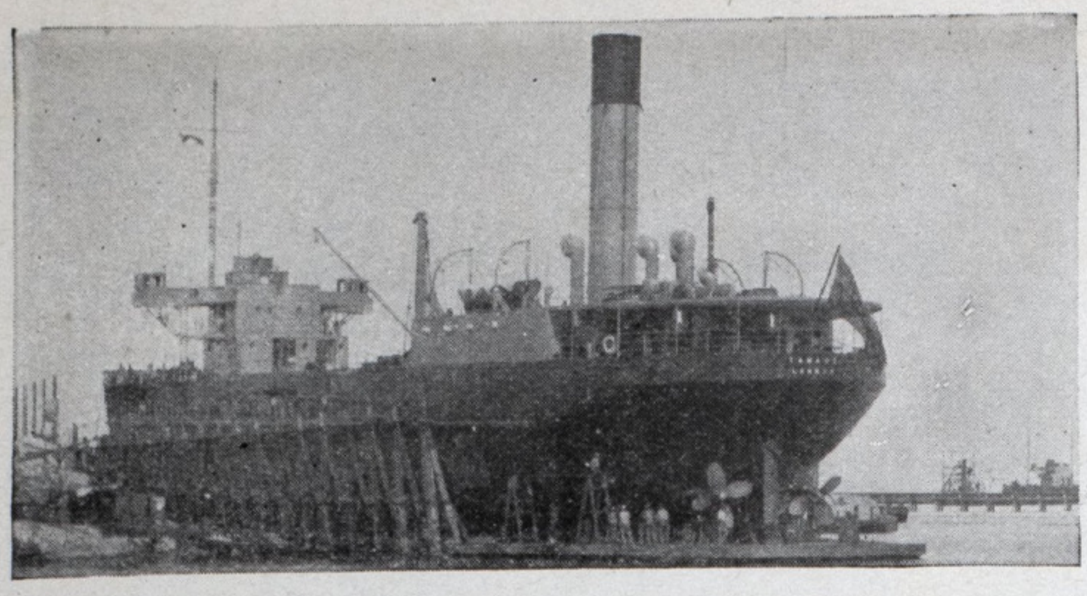

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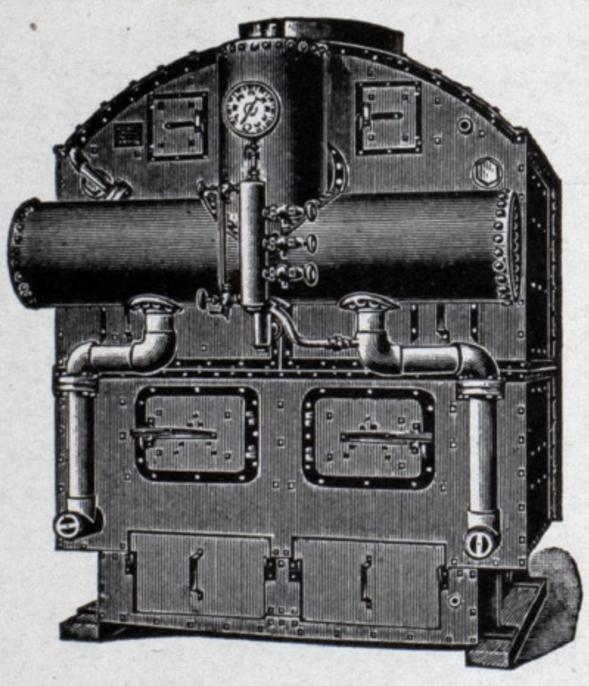
C&B LINE



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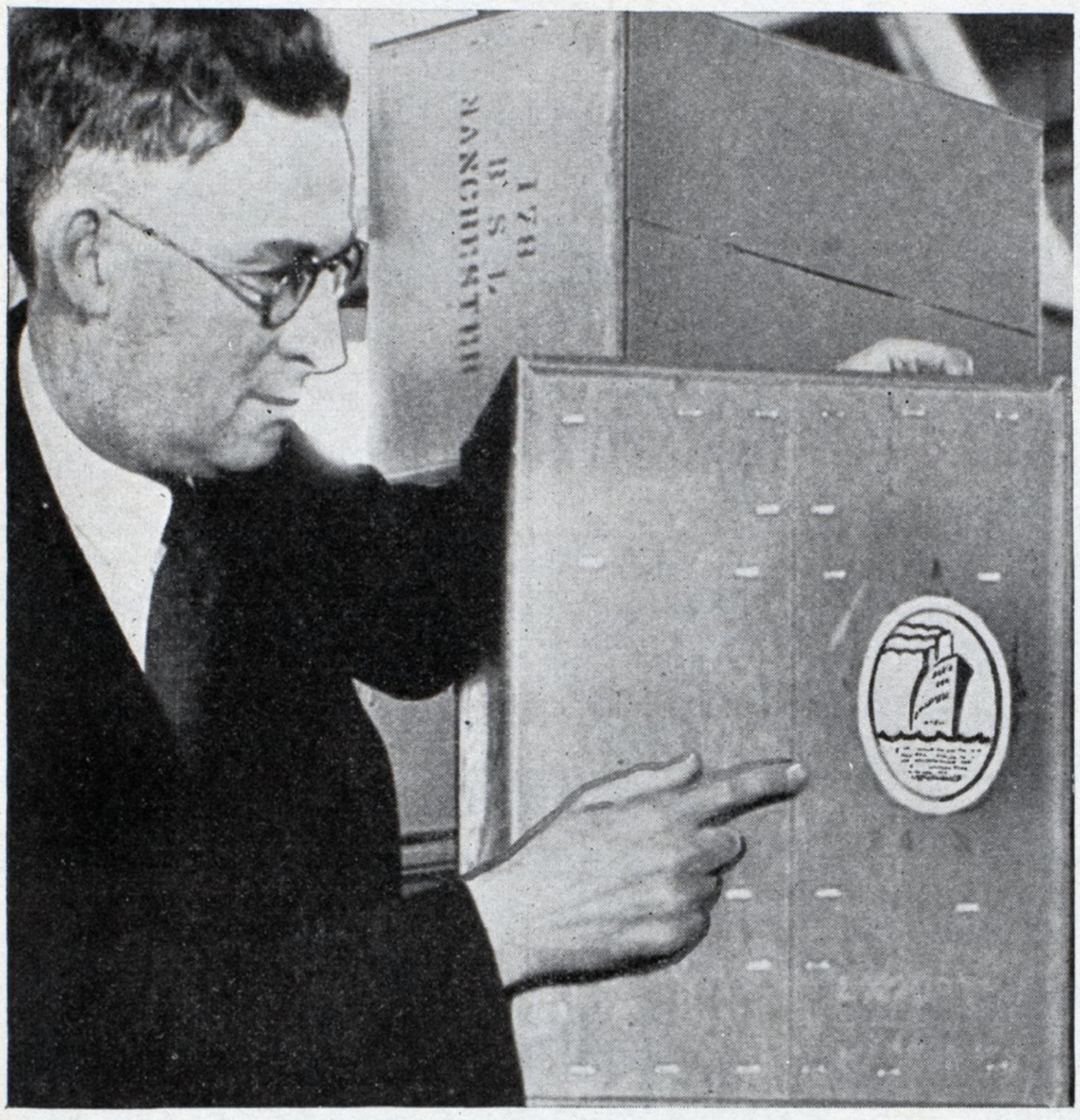
THE MEANING of the EFCA TRADEMARK...



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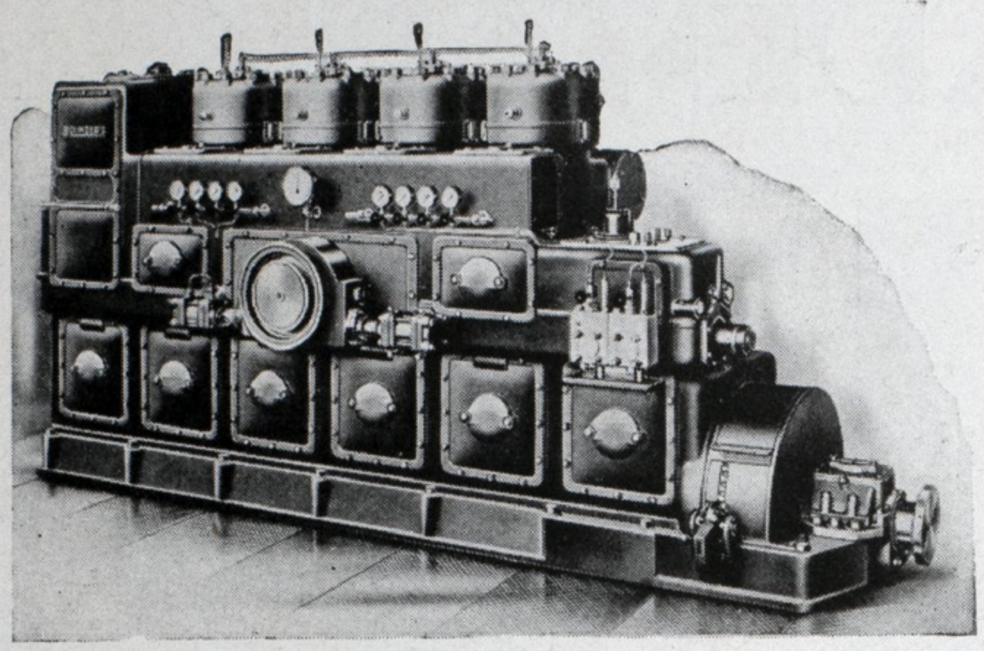
FULL DIESEL ENGINES



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Quick Manoeuvering
Extremely low fuel and lubricating oil consumption
Removable liners in cylinders and fuel pumps
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Made in sizes up to 1000 B.H.P.

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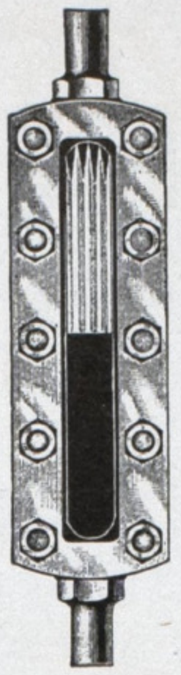

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"The Water Shows Black"

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WOULD LIKE TO MAKE MY HOME WITH SOME CAPTAIN. Experienced fireman, oiler, etc. have nearly 50 years experience on lakes. Am an able man. Address Box 427, MARINE REVIEW, Penton Bldg., Cleveland, Ohio.

FOR SALE
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All steel construction, 108′ long, 24′ beam, 14½′ molded depth, 650 H.P. triple expansion engine 15½″ x 26″ x 44″ x 26″ stroke. Scotch Marine Boiler, 180 pounds working pressure.

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Heavy wood hull, 180′ long, 48′ beam, 14½′ deep, 1800 ton capacity, 25 ton derrick forward and 18 ton derrick aft. Derricks stiff leg swing circle type, equipped with 3 yard and 2 yard clams.
Entire outfit in excellent operating condition. May be inspected at Superior, Wisconsin.
Complete details furnished on request.
The Barnett & Record Company
700 Flour Exchange
Minneapolis, Minn.

FOR SALE OR CHARTER
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290 Gross Tons
124′ Keel. 28′ Beam. 7′ Depth.
New Boiler. Two 10 x 12 Vertical Engines. 12″ Morris Pump driven by 9 x 9 Morris Engines. Splendid condition. Low price. Erie Sand & Gravel Company, Erie, Pa.

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MARINE PUMPS

"The Dean of Pumps on Land and Sea"

Single Style & Duplex
Piston Type & Plunger

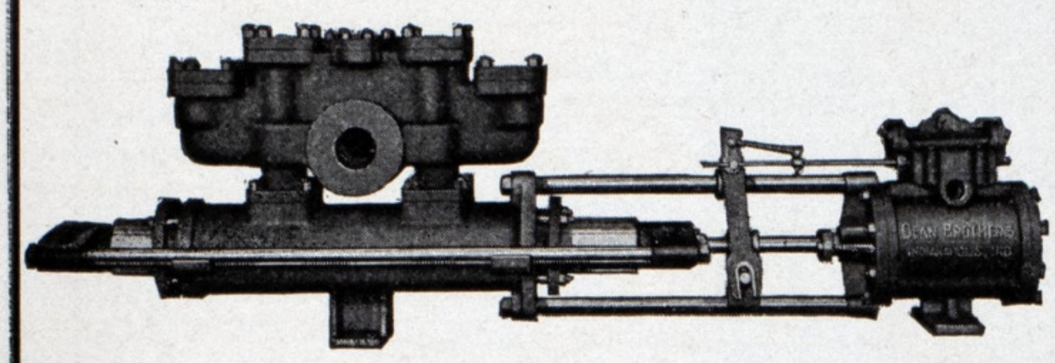

Figure No. 2311 Horizontal Single Style Double Acting Outside End Packed Plunger Trombone Pot Valve Pump For Boiler Feed & Pressure Service.

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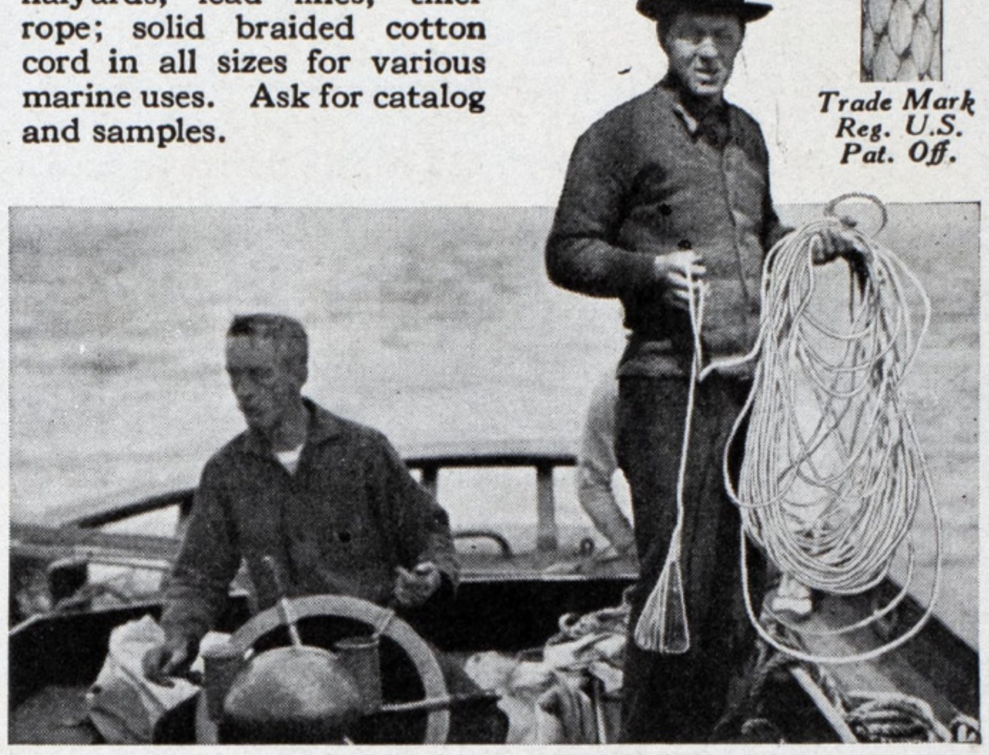
Trade Mark Reg. U.S. Pat. Off.



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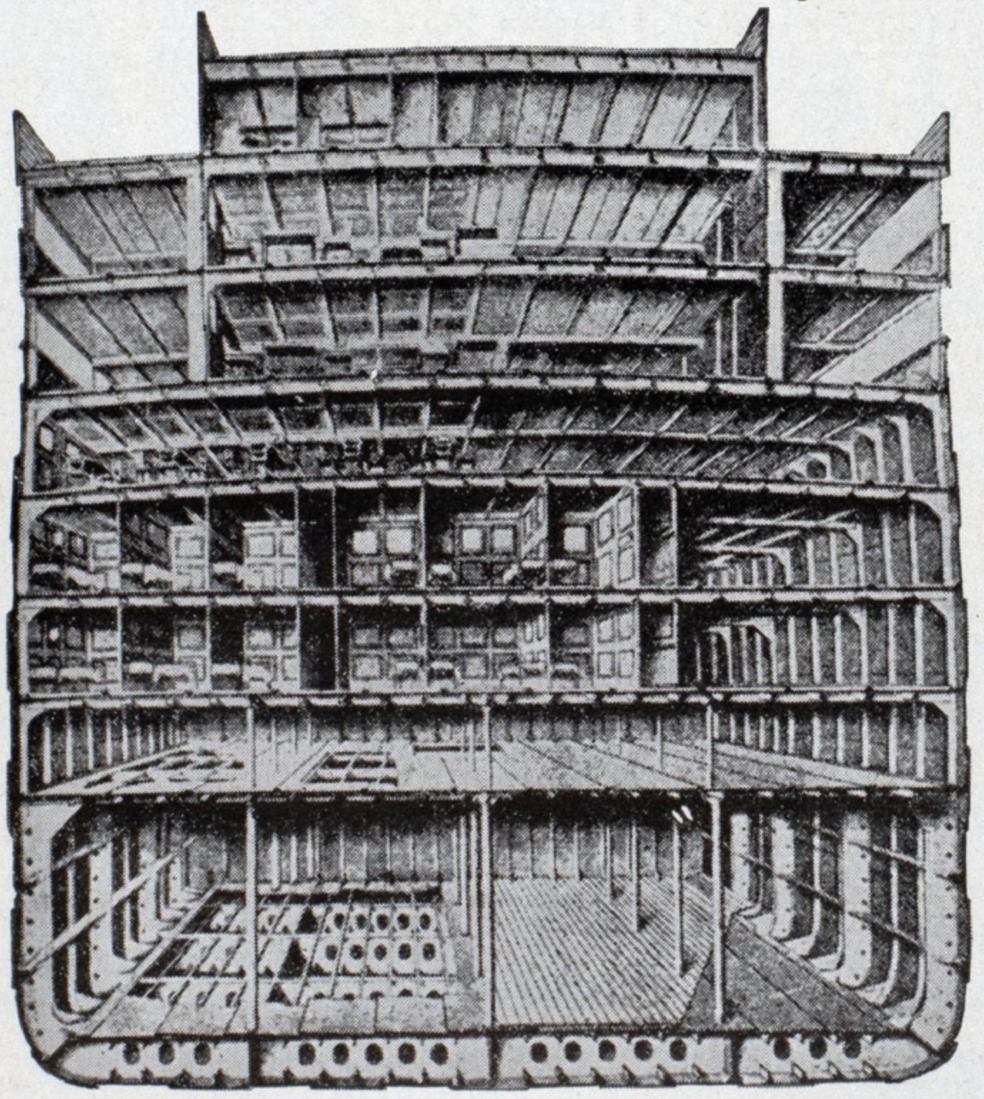
Isherwood Combination System



Sectional View of Interior of Passenger Liner designed on the Isherwood Combination System

(In a vessel of this type, deep transverses are recommended for hold construction, but are not essential.)

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Shipowners are advised to specify that plans and structural arrangements should be approved by

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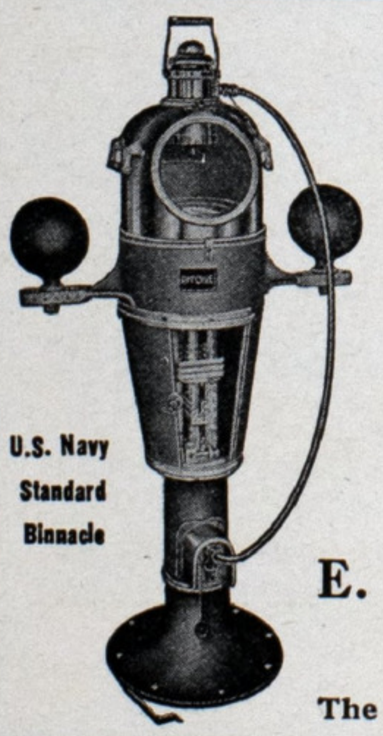

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Statement of the ownership, management, circulation, etc., required by the act of congress of Aug. 24, 1912, of MARINE REVIEW published monthly at Cleveland, Ohio, for April 1, 1932, State of Ohio, county of Cuyahoga, ss. Before me, a notary public in and for the state and county aforesaid, personally appeared J. D. Pease, who, having been duly sworn according to law deposes and says that he is the Business Manager of MARINE REVIEW and that the following is to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of Aug. 24, 1912, embodied in section 411, Postal Laws and Regulations, to wit: 1.—That the names and addresses of the publisher, editor, managing editor and business managers are: Publisher, The Penton Publishing Co., Cleveland, O. Editor, A. H. Jansson, Cleveland, O.; Business Manager, J. D. Pease, Cleveland, O. 2.—That the owners are: Names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock: The Penton Publishing Co., Cleveland, O.; John A. Penton, Cleveland, O.; C. J. Stark, Cleveland, O.; J. D. Pease, Cleveland, O.; F. V. Cole, Cleveland, O.; J. R. Dawley, Cleveland, O. 3.—That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None. 4.—That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. J. D. Pease. Sworn to and subscribed before me this 30th day of March, 1932. (Seal) H. L. Richey. (My commission expires May 7, 1933).

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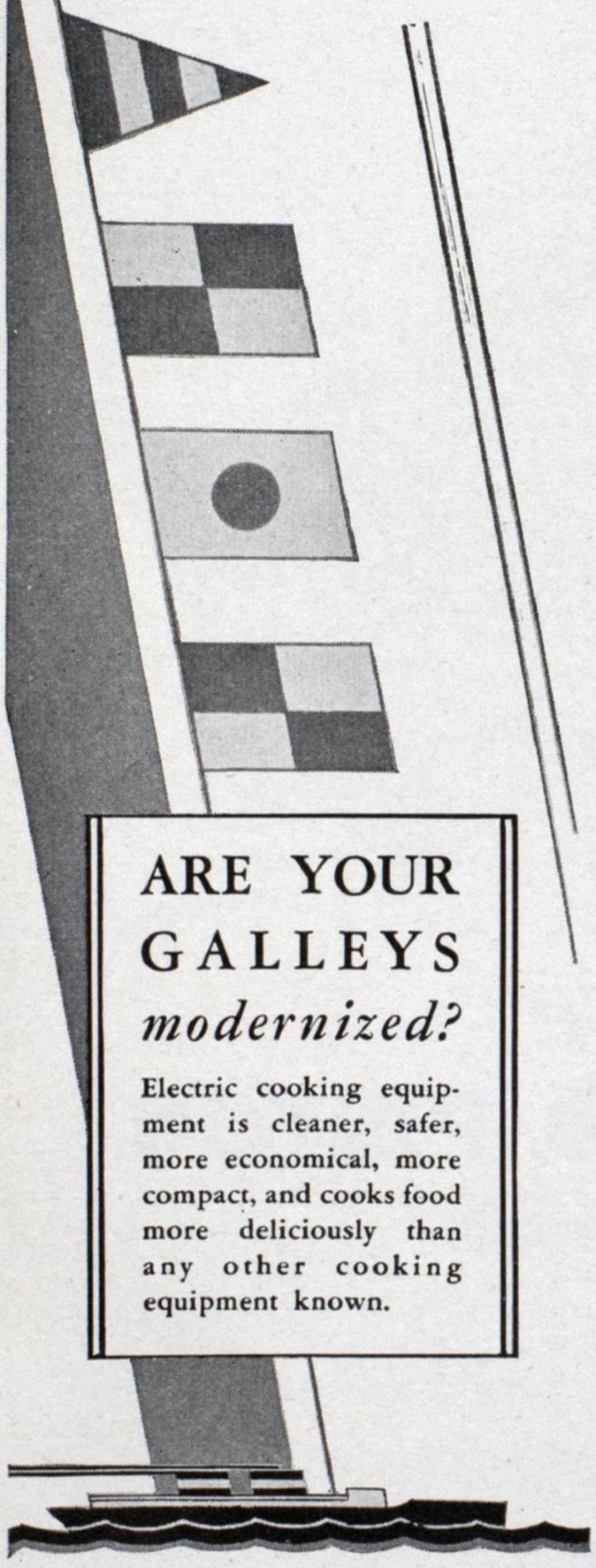

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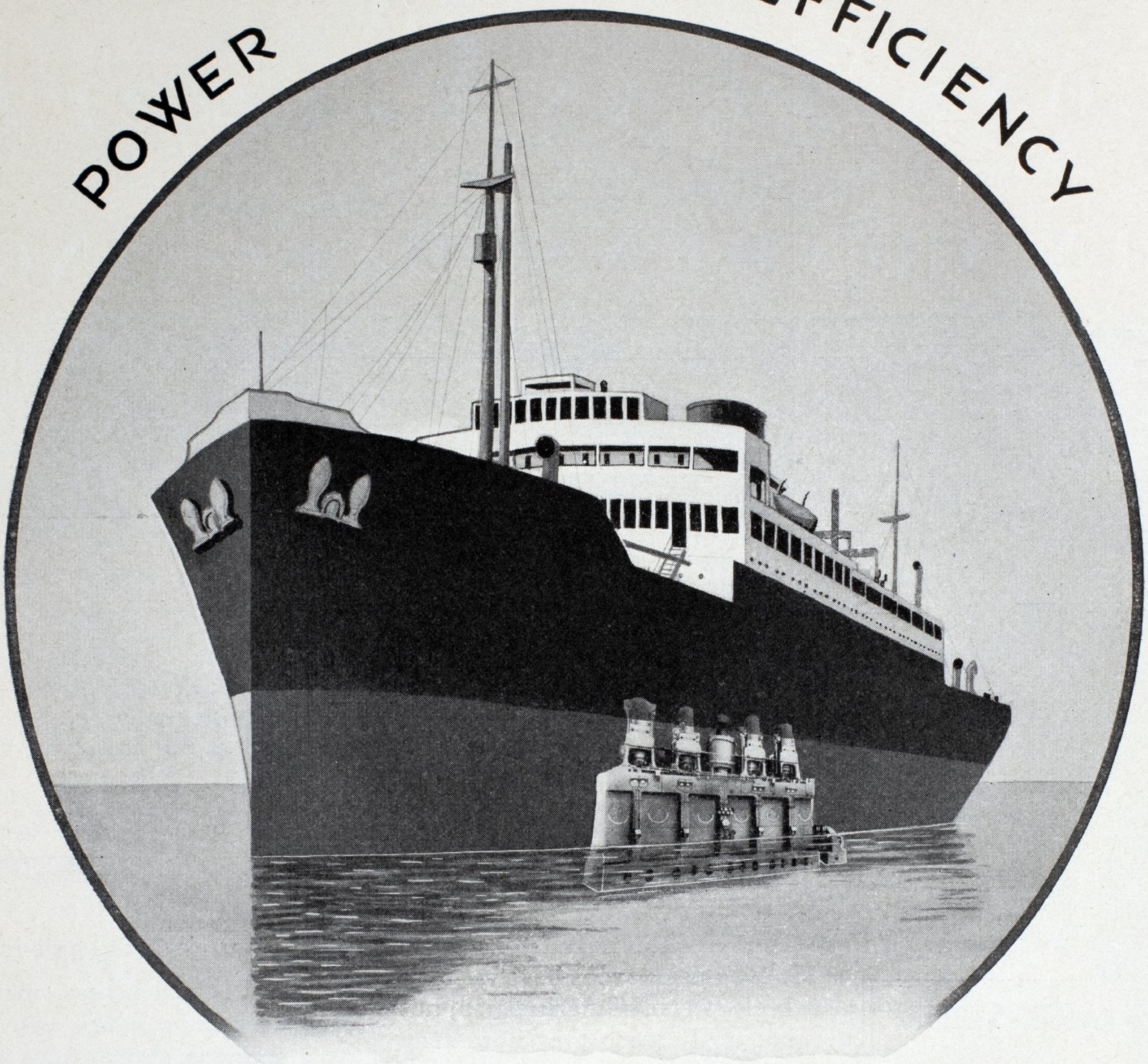

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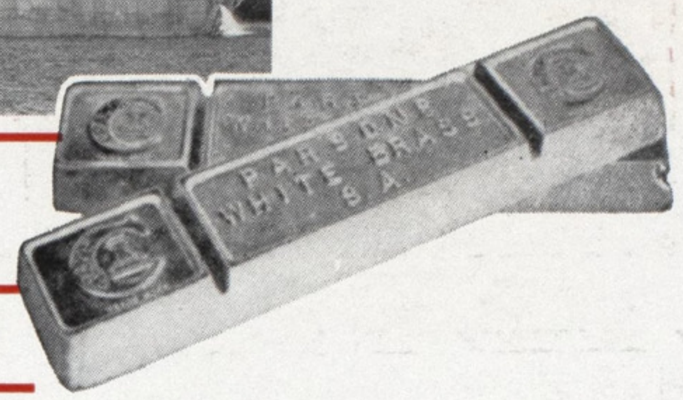

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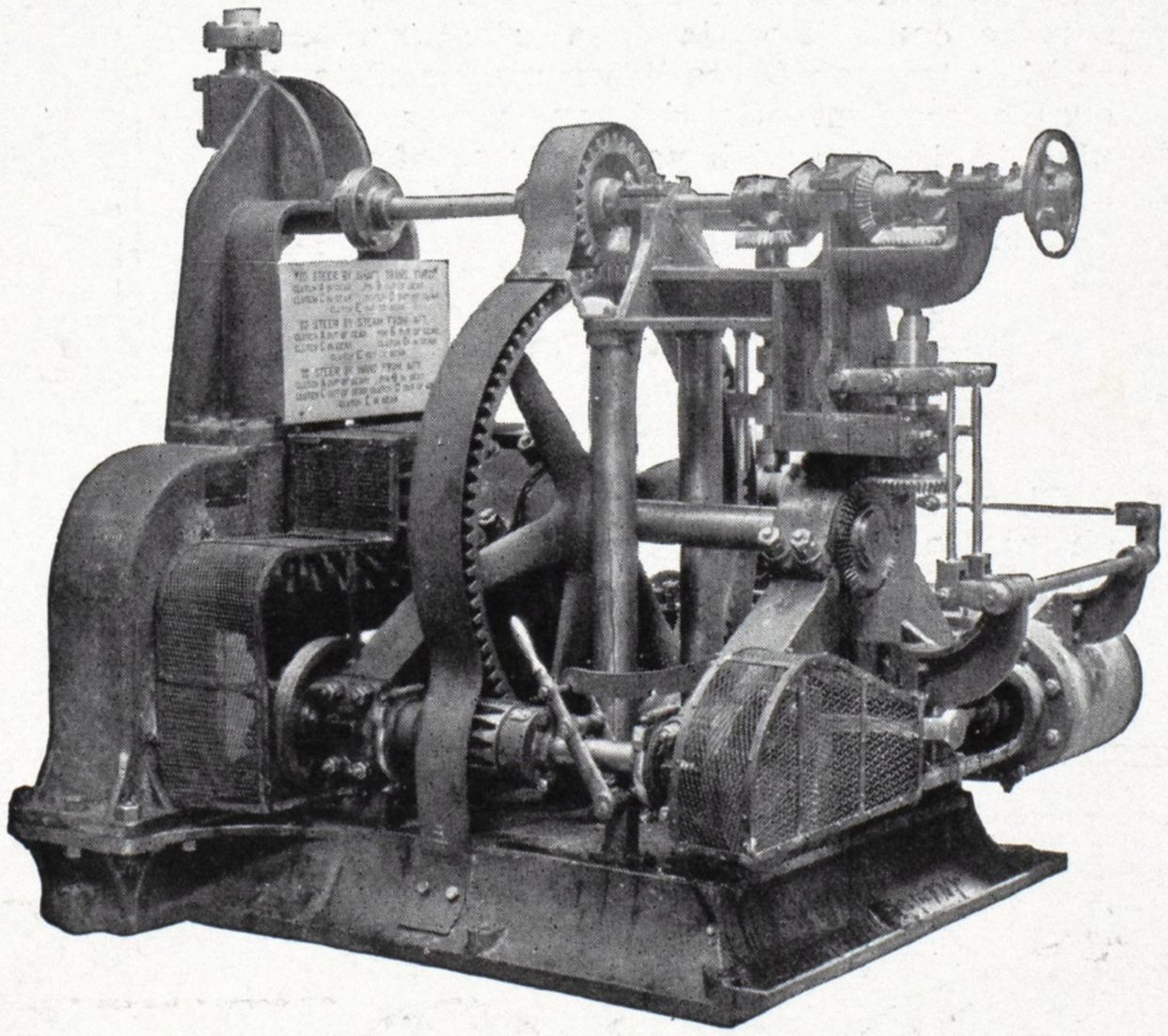

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